# DEFENSE INDUSTRY BULLETIN

Volume 1 No. 3

March 1965

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**ASSISTANT SECRETARY OF DEFENSE-PUBLIC AFFAIRS**

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## DEFENSE BUDGET HIGHLIGHTS

". . . the program supported by this budget will increase our overall combat effectiveness and will provide effective forces in a high state of readiness for the defense of the vital interests of the United States."

Thus concludes Secretary of Defense Robert S. McNamara in the introduction to the statement he made on February 18, 1965, before the House Armed Services Committee on the "Fiscal Year 1966-70 Defense Program and 1966 Defense Budget," extracts of which begin on Page 1.

In recognition of the importance industry has come to attach to the Secretary of Defense's posture statement in assessing DOD plans and programs, this issue of the *Defense Industry Bulletin* is devoted almost entirely to its reproduction.

While space limitations permit only an abbreviated treatment of the statement, an attempt was made to include those portions of special interest to defense industry.

We hope that this presentation of the posture statement will contribute to a fuller understanding by industry of the nation's defense needs.

The Editors.

**DEFENSE INDUSTRY**
**BULLETIN**

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The *Defense Industry BULLETIN* is published monthly by the Business & Labor Division, Directorate for Community Relations, Office of the Assistant Secretary of Defense (Public Affairs). Use of funds for printing this publication was approved by the Director of the Bureau of the Budget.

The purpose of the *BULLETIN* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *BULLETIN* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *BULLETIN* is distributed each month to the agencies of Department of Defense, Army, Navy, and Air Force, and to representatives of industry. Request for copies should be addressed to the Business & Labor Division, OASD/PA, Room 2E813, The Pentagon, Washington, D.C. 20301.

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## Industry Expected To Benefit From ARPA Optical Grant Program

Plans to initiate a one-time optical equipment grant program to qualified U. S. universities that will eventually benefit defense industry were announced by the Advanced Research Projects Agency (ARPA).

Taking steps now to enhance the capability of the academic community will produce highly trained scientists required by industry and government to meet the needs of national defense at all times.

The program is intended to permit a higher degree of sophistication in optical research at these institutions. The major objective is to catalyze or assist in enlarging graduate programs in modern optics to provide, over a period of time, an output of capable and trained individuals in the appropriate disciplines.

Generally, individual grants will be limited to $200,000 or less. As a guide in the definition of modern optics, universities have been provided an illustrative list including Geometrical and Physical Optics, Electromagnetic Waves, Coherence Phenomena and Statistical Optics and Quantum Optics.

As part of its effort to assist the academic community in solving defense problems of the future, ARPA previously initiated grant programs for equipment for materials research and, through its program of Interdisciplinary Research on Materials, it provides continuing support for an expanded program of university research in the materials sciences.

## Military Construction Bill Goes To Congress

A Military Construction Bill requesting new authorization in the amount of $1,945,497,000 was submitted by the Department of Defense to the Congress for Fiscal Year 1966. New construction projects directed primarily to the strengthening of our military posture on a world-wide basis amount to $1,438,331,000 of the total requested, including $228,434,000 for the construction of 12,500 new family housing units. The balance of the request, amounting to $507,166,000, covers other family housing costs which require annual authorization, including amounts for operation and maintenance, repair and improvement of existing units.

Proposed construction sites are located at over 300 installations throughout the United States, as well as at locations in the Caribbean, Europe, Pacific Islands, Iran, Japan, and the Philippines. Projects are also proposed in support of such essential contributing Defense activities as research and development, supply, medical care, training and intelligence. The bill will provide many needed replacements for obsolete and inefficient facilities, necessary to reduce the cost of base operations and maintenance. Details follow:

|  | *UNITED STATES* | *OVERSEAS* | *UN-SPECIFIED* | *TOTAL* |
|---|---|---|---|---|
| Army | $305,020,000 | $76,559,000 | $10,000,000 | $391,579,000 |
| Navy | 240,944,000 | 62,649,000 | 10,000,000 | 313,593,000 |
| Air Force | 280,509,000 | 92,821,000 | 10,000,000 | 383,330,000 |
| Reserve Components | 21,200,000 | — | — | 21,200,000 |
| Defense Agencies | 26,507,000 | 3,688,000 | 70,000,000 | 100,195,000 |
| Family Housing |  |  |  | 735,600,000 |

# Defense Budget Highlights

## Approach To The FY 1966-70 Program And The FY 1966 Budget

*[For the sake of clarity and continuity, paragraph markings have been deleted from the original text to the Secretary of Defense's posture statement. In addition some subheads have been added to assist the reader in locating individual programs and projects.]*

As I have reported to you before, when I took office in January 1961, President Kennedy gave me two general instructions:

- Develop the military force structure necessary to support our foreign policy without regard to arbitrary budget ceilings.
- Procure and operate this force at the lowest possible cost. President Johnson has emphasized that these same basic principles should guide the development of the FY 1966-70 programs and the FY 1966 budget request.

Our Defense program and budget is based solely on our own national security requirements and is not related to the announced reductions in Soviet defense expenditures. Of course, in planning our own forces, we do take account of the size and character of the opposing forces. But, until we have independent evidence, acquired through our own sources, that reductions have actually been made, we do not reflect them in our intelligence estimates.

The decline in our own Defense expenditures from a high of $51.2 billion in FY 1964 to an estimated $49.0 billion in FY 1966 simply reflects the substantial completion of the build-up started in 1961 and the results of our highly successful cost reduction program.

In developing the FY 1966-70 program and the FY 1966 budget, I have carefully reviewed all of the proposals originating from the Joint Chiefs of Staff, the military departments and other Defense agencies. This process began nearly a year ago, and through a step-by-step review of the 1966 and prior year programs, it was possible to reduce the FY 1966 budget request from about $56.5 billion in new obligational authority, as proposed by the Services and Defense agencies, to approximately $48.6 billion, a reduction of about $8 billion. Thus, our FY 1966 request for new obligational authority is $1.2 billion less than the amount appropriated for the current fiscal year (including the proposed FY 1965 supplemental). Expenditures in FY 1965, currently estimated at $49.3 billion, will be about $1.9 billion less than the amount estimated a year ago. FY 1966 expenditures are estimated at $49.0 billion, about one-third billion dollars less than now estimated for the current fiscal year. While our FY 1966 budget request does not include all of the forces or force modernizations recommended by the military departments and individual Service chiefs, the Joint Chiefs of Staff agree that the program supported by this budget will increase our overall combat effectiveness and will provide effective forces in a high state of readiness for the defense of the vital interests of the United States. . . .

### The Defense Program And The Economy

Federal expenditures on goods and services for national defense and related purposes (atomic energy and space) have accounted in recent years for approximately ten percent of our gross national product and nearly one-tenth of our total employment. Of the roughly 6.7 million persons estimated to be engaged in defense work, over half are employed directly by the Federal Government. The rest work either for contractors and subcontractors employed on defense programs or for firms providing materials and services to defense contractors. However, the distribution of this work by industry, by company and by community is very uneven. Most defense-related work is concentrated in five manufacturing industries—ordnance, aircraft, shipbuilding, communications equipment and electronic components. These major Defense industries are, themselves, highly concentrated in certain states and geographic areas and, indeed, our military installations, with their military and civilian complements, are also geographically concentrated to a considerable degree, not infrequently in the same areas as Defense Industries. In some states more than ten per cent of total personal income is derived from Defense Sources and in many communities the Defense contractors are the principal sources of employment.

National Defense programs also employ a very large proportion of the nation's engineers, scientists, technicians and highly skilled craftsmen. Over half of the total national research and development effort is supported by these programs. Indeed, the "aircraft and parts" and the "communications and other electrical equipment" industries, which receive more than three-quarters of all Federal Government research funds spent in industry, employ over one-fourth of all engineers and scientists in American industry and well over one-third of those are engaged primarily in R&D.

Thus, the Defense Department, as the principal Federal agency engaged in these programs, has a vital concern with their impact both on the Nation as a whole and on the individuals, communities, companies and industries involved. We recognize our obligation to do everything we properly can to minimize the disruptive effects of changes in our programs and to assist, insofar as we are able and the law permits, those who are adversely affected by these changes. The Defense Department, however, cannot and should not assume responsibility for creating a level of demand adequate to keep the economy healthy and growing. Nor should it, in developing its programs, depart from the strictest standards of military need and operating efficiency in order to aid an economically distressed company or community. The Congress has underscored this limitation by explicitly forbidding in our annual appropriation act "the payment of a price differential on contracts . . . for the purpose of relieving economic dislocations."

Defense Department policy in this regard is to buy what we need, when we need it, at the lowest cost to the Government, quality and delivery schedules considered.

There are, however, a number of measures which the Government can take to alleviate hardships on particular individuals and communities during the period of readjustment, again keeping in mind that the problems of adjustment stemming from changes in Defense spending are generally similar in nature to the dislocations which result from other economic and technological changes. These include:

- The maintenance of employee income during the period of readjustment. This is the task of the Federal-State unemployment insurance system, improvements to which are now being studied.
- Job information and placement services. The Department of Labor operates several major programs in this area which, although not specifically designed to deal with problems arising from Defense-related shifts, have proven useful in easing the impact of previous curtailments in Federal expenditures. These include the Federal-State Employment Service, the Mass Layoff and Community Employment Development programs and a supplemental data processing and telecommunications system to facilitate inter-area recruitment. Various State employment services have also developed special programs to cope with sudden unemployment problems.
- Training and retraining. Among the programs in this area are those under the Manpower and Development Training Act and those of the Area Redevelopment Administration. The DOD itself, in cooperation with other agencies, has developed its own training programs for

Government workers displaced by base closings. Maximum use is made of authority to waive formal qualification requirements and to enter into training agreements with the Civil Service Commission. In addition to the training programs available generally, Defense Department contractors are also allowed separation or retirement expenses as part of regular contract termination costs as well as the costs of training and education related to new jobs with the same employer.

• Relocation allowances. Except for the limited experimental program now being planned under the Manpower and Development Training Act, there is no major Federal program of assistance for relocating displaced employees of Defense contractors. The 1964 tax revision, however, does permit deduction of personal moving expenses when incurred because of a change in jobs. With regard to Defense Department employees, the Department will pay appropriate expenses of moving them, their dependents and household effects when they are displaced by base closings and are transferred to new posts. The Federal Housing Administration has a program of mortgage forbearance which is of help to workers faced with the problem of disposing of their homes when they have to leave a community for new employment.

• Assistance to communities. The Federal Government has a number of programs to assist communities adversely affected by changes in defense and defense-related programs. As you know, we have established within the DOD an Office of Economic Adjustment. This office has been expanded and strengthened during the last year. A Select Advisory Committee, consisting of representatives of a number of Federal agencies, provides the coordinating mechanism for the efforts of those agencies and the Office of Economic Adjustment in assisting local communities.

In working with these communities, the Office of Economic Adjustment encourages and assists local leadership to identify and exploit their own resources for economic growth. Officials of local defense firms are encouraged to participate in the community effort. Members of the staff of the Office of Economic Adjustment visit the communities on their invitation, provide ideas and advice and serve as the Office helps communities to identify Federal programs applicable to the local problems and puts them in touch with the appropriate Government offices. . . .
a focal point for community efforts. Where appropriate

• Assistance to firms. In a free enterprise, competitive economy, it would be inappropriate for the Government to subsidize individual firms, even those engaged primarily in supporting the Defense program. To do so would be to discriminate against non-Defense firms. We do, however, have a number of programs designed to assist Defense contractors in adjusting to program changes. One of these is the series of industry briefing sessions that we have scheduled for March and April of this year which we hope will provide Defense contractors with a better understanding of the future trends in the Defense program. We have recently revised the Armed Services Procurement regulation to allow under Defense contracts an applicable portion of the "costs of generalized long-range management planning which is concerned with future overall development of the contractor's business and which may take into account the eventual possibility of economic dislocations or fundamental alterations in those markets in which the contractor currently does business." We also give certain limited preferences to chronically depressed and surplus labor market areas and provide for an equitable participation by small business firms. The Small Business Administration, itself, has both financial and technical assistance programs that may be of aid to small firms affected by Defense program changes.

The ability of our free enterprise economy to adjust to change is one of its greatest strengths. It is through the free market mechanism that resources are shifted from areas of declining demand to areas of expanding demand, and from less profitable to more profitable use, to the benefit of the entire nation. The programs I have described are designed to facilitate this shift in resources, not to impede it; they are also designed to alleviate the hardships on the individuals and communities concerned.

**Impact of the Defense Program on the Balance of Payments.**

The persisting deficit in our Nation's international balance of payments and the impact of the Defense Department's program on that deficit continues to be a major concern. During 1958-1963, that deficit averaged about $3.5 billion annually on regular transactions (about $3 billion annually considering special transactions). For the same period, U. S. gold stocks declined by nearly $7.5 billion to a level of about $15.6 billion while liquid liabilities to foreigners, an important part of which represents a claim on our gold stocks, rose more than $9 billion to a level of over $25 billion. Although we expect the overall U. S. balance of payments for 1964 to show some improvement over the 1958-1963 average, we find no cause for relaxing our efforts to reduce the net foreign exchange costs of our military programs. As shown in the table below, we have made good progress toward that objective since 1961, while still maintaining our overseas combat capability and avoiding the creation of hardships for our military and civilian personnel and their dependents.

| U.S. Defense Expenditures | Actual 1961 | Actual 1962 | Actual 1963 | Actual 1964 |
|---|---|---|---|---|
| | ($ Billions, Fiscal Years) | | | |
| U.S. Forces and their Support | 2.5 | 2.5 | 2.5 | 2.5 |
| Military Assistance | .3 | .2 | .3 | .3 |
| Other (AEC, etc.) | .3 | .3 | .2 | .1 |
| TOTAL | 3.1 | 3.0 | 3.0 | 2.9 |
| Cash Receipts from Sales | –.3 | –.9 | –1.3 | –1.3 |
| NET ADVERSE BALANCE | 2.8 | 2.1 | 1.7 | 1.6 |

The *net* adverse balance of payments on the Defense account was reduced about $1.2 billion between FY 1961 and FY 1964, bringing it to a level of about $1.6 billion. We hope to make a further reduction in order to bring it to an annual rate of about $1.4 billion.

The amounts in the table do not include the balance of payments effects of barter transactions, which might also have been shown as an additional receipt offsetting our expenditures. These "receipts" amounted to approximately $25 million in FY 1964 and are expected to increase.

The following are some of the measures we are taking which serve to reduce the *net* adverse impact of Defense expenditures abroad:

• Military assistance offshore procurement generally is being limited essentially to the fulfillment of prior commitments.

• The number of overseas headquarters personnel was reduced by about 2,600 during FY 1964; we are also reducing overseas logistical support activities with further significant reductions in personnel and savings in foreign exchange costs.

• Employment of foreign nationals was reduced by over 28,000 in FY 1964.

• Advantage is being taken of the growing capabilities of our allies to assume certain functions now performed by U. S. forces. In Spain and Japan, for example, certain air defense responsibilities already have been transferred, thus permitting withdrawal of some U. S. forces to the U. S.

• Our effort to maintain and, if possible, increase our receipts from military sales is being continued on an intensified basis. As I noted last year, while a number of countries are making or contemplating purchases of U. S. military goods and services, by far the largest and most important is the agreement with the Federal Republic of Germany to offset our military expenditures in Germany with equivalent military purchases from the U. S. Moreover, as reported last year, a number of cooperative logistics support arrangements have been consummated or are in negotiation, the most important again with the Federal Republic of Germany. In addition to the balance of payments benefits, these arrangements provide an excellent opportunity for increased standardization of equipment and common logistics procedures among Allied nations, particularly those in NATO.

# Strategic Defensive And Offensive Forces

This year for the first time we are including in a single chapter the discussion of the three major programs which constitute our general nuclear war forces: The Strategic Offensive Forces, the Continental Air and Missile Defense Forces, and Civil Defense. . . .

### Nature of the General Nuclear War Problem

. . . In the event of general nuclear war, . . . the following types of U.S. strategic forces would be involved:
Strategic Offensive Forces.

- Manned bombers, strategic reconnaissance aircraft, intercontinental ballistic missiles and submarine-launched missiles, and their associated support forces and command and control systems.

Strategic Defensive Forces.

- Anti-aircraft defenses: manned interceptors; surface-to-air missiles; and their associated warning and control systems (including a capability against air breathing missiles).
- Anti-ballistic missile defenses: anti-missile missiles together with the associated sensing, data processing and communications systems; and the anti-submarine warfare forces directed against enemy missile launching submarines, together with the associated sound surveillance systems.
- Anti-satellite defenses: Interceptor missiles and the space detection and tracking systems.

Civil Defense Programs.

- Fallout shelters, warning, etc.

The strategic objectives of our general nuclear war forces are:

- To deter a deliberate nuclear attack upon the United States and its allies by maintaining a clear and convincing capability to inflict unacceptable damage on an attacker, even were that attacker to strike first.
- In the event such a war should nevertheless occur, to limit damage to our populations and industrial capacities.

. . . it seems to me that there are six major issues involved in our FY 1966-1970 general nuclear war programs. These issues concern:

- The development and deployment of a new manned bomber (estimated five-year systems cost—$8.9 to $11.5 billion).
- The size of the strategic missile force (estimated five-year cost for an additional 200 Minuteman II missiles—$1.3 billion).
- The overall level of the anti-bomber defense program (estimated five-year cost if units proposed for phase out are retained in the forces—$300 to $350 million).
- The production and deployment of a new manned interceptor (estimated five-year cost—$4 billion).
- The production and deployment of the Nike X anti-missile system (estimated five-year cost—$24 billion).
- The construction of fallout shelters for the entire population (estimated cost to individuals, state, local and Federal Government—$5 billion).

The first two issues are related to the Strategic Offensive Forces, the next three to the Strategic Defensive Forces and the last to the Civil Defense Program. I will discuss each of them in context with our other proposals for these three components of our general nuclear war posture.

### Strategic Offensive Forces

**The Development and Deployment of a New Manned Bomber.** . . . it would seem wise to keep open the option of continuing at least some manned bombers in our strategic offensive forces indefinitely, if need be. This we propose to do.

With appropriate maintenance and modification, the current B-52's can be operated, safely and effectively, through the early or mid-1970's. . . . $339 million is included in our FY 1966 budget request for these purposes. . . .

There are at least two other alternatives available to us, in addition to the immediate development of the AMSA (Advanced Manned Strategic Aircraft), which would preserve the manned-bomber option for the period following the retirement of the B-52 force. These are (a) the procurement of a strategic version of the F-111 (i.e., a B-111) and (b) the initiation of advanced development work on long lead time components which would be needed for the AMSA as well as for other new combat aircraft. . . .

Considering the other alternatives available, the high cost of an AMSA fleet ($8.9 to $11.5 billion for the one proposed), the need to develop a new engine and avionics, the still-existing uncertainties as to the kind of new bomber we would want by the mid-1970's, and the remaining B-52 life which exceeds the lead time required for development of new aircraft, I do not believe we are ready to go ahead with a full AMSA development at this time. But I do believe it would be desirable to keep open the option for developing such an aircraft as a replacement for the B-52's when they have to be retired.

We therefore propose:

- To continue our efforts to define the specifications and basic design approaches of several alternative strategic aircraft, a program requiring $5 million in FY 1965 and $3 million in FY 1966.
- To initiate an advanced avionics development program which would be applicable to current and future strategic and tactical combat aircraft, a program requiring $7 million in FY 1965 and $12 million in FY 1966.
- To initiate an advanced propulsion program which would be applicable to current and future high performance strategic and tactical combat aircraft, a program requiring $16 million in FY 1965 and $24 million in FY 1966.
- To initiate development of a new short range attack missile (SRAM), a program requiring $5 million in FY 1965 and $37 million in FY 1966. (The total cost of this development is estimated at $100 to $150 million.) No decision needs to be made now on the production and deployment of this missile.

In FY 1965, the first three actions will require $28 million of the $52 million appropriated by the Congress for the development of advanced manned strategic aircraft. We propose to apply the remaining $24 million to the FY 1966 requirement, totaling $39 million. The balance of $15 million has been included in our 1966 budget request. . . .

**Strategic Reconnaissance.**

. . . On the basis of the testing to date, we have every reason to believe that the performance of the SR–71 will meet or exceed its specifications. The total development and procurement costs of the SR–71 program through the presently planned deployment is now estimated at about $950 million.

**Strategic Missile Forces**

. . . On the basis of our analysis of the general nuclear war problem in the early 1970's, I am convinced that another 200 Minuteman silos are not required at this time. We now believe that we can markedly increase the "kill" capabilities of the Minuteman force through a number of qualitative improvements which now appear feasible. . . .

. . . $168 million is included in our FY 1966 request to continue advanced development work on penetration aids and improved re-entry systems. . . .

We propose to initiate project definition of the Poseidon missile this fiscal year with $10 million of available FY 1965 funds. Another $35 million has been included in the FY 1966 budget to continue development. Since we are still uncertain about the ultimate shelf life of the present Polaris missiles and the time when a potential aggressor might deploy an ABM system, the pace of the Poseidon development has not yet been precisely established. Total development costs for this missile could approximate $900 million. The cost of retro-fitting a force of, say, 19 submarines with the Poseidon missile could amount to as much as $2 billion, including the cost of missile development and production. . . .

### Strategic Defensive Forces

**The Overall Level of the Anti-Bomber Defense Program.**

. . . During the last four years we have made some progress in reorienting the anti-bomber defenses to the changing character of that threat. The vulnerability of the system is being reduced by providing an improved backup to the SAGE system and by dispersing the manned interceptors. Marginal and obsolete units have been eliminated from the forces and new and more effective systems are being introduced. This effort will be continued during the FY 1966-1970 program period.

**Surveillance, Warning and Control.** The surveillance, warning and control network constructed during the 1950's was oriented to manned bomber attack through the northern approaches over Canada and around the flanks through the Atlantic and Pacific oceans. . . . Thus, the arrival of the missiles would, in itself, signal the attack long before the bombers could reach their targets. As a result, large portions of the existing surveillance, warning and control system constructed during the 1950's are either obsolete or of marginal value to our overall defense.

**Semi-Automatic Ground Environment System (SAGE).** . . . Instead of the BUIC II, we now plan to deploy BUIC III in combination with SAGE Direction Centers. . . . Additional funds have been included in the FY 1966 budget for the SAGE/BUIC system.

**Radars.** . . . in order to make the inputs from the 27 FAA radars usable in the automated SAGE/BUIC III system, they must be converted into the appropriate computer language by what is called a "digitizer." We plan to test a new type of digitizer this summer and buy half of the requirement in FY 1966 and the balance in FY 1967. About $11 million has been included in our FY 1966 budget request for this purpose. . . .

**Manned Interceptors.** Considering the size and character of the bomber threat we are likely to face through FY 1970, I believe the present manned interceptor force is larger than needed. . . .

**Surface-to-Air Missiles.** The surface-to-air missile programs are essentially the same as those described here last year.

**Qualitative Improvements to the Anti-Bomber Defenses.**

While the present anti-bomber forces may be considered quantitatively excessive in the light of the threat, further improvements need to be made in the qualitative characteristics of the forces.

I have already touched on the planned improvements to the SAGE/BUIC system. We have also included funds in the FY 1966 budget for a number of other possible improvements in the more distant future.

**Production and Deployment of a New Manned Interceptor.** By far the most important issue in the anti-bomber defense area is the production and deployment of a new manned interceptor . . . . it is not at all clear at this time that a new manned interceptor system would have priority over new advanced surface-to-air missile systems now under study.

Nor is it clear at this time that the YF–12A, which has already been substantially developed, would be preferable to an interceptor version of the F–111. . . .

The F–111 is already nearing production. The Navy version, the F–111B, together with the Phoenix air-to-air missile systems now in development, is essentially an interceptor aircraft and could be modified for use in continental defense. We will continue to have this option for some time into the future since the F–111 will be in production at least through the end of this decade.

The development of the YF–12A has been underway since FY 1962. About $180 million has been programmed for this project through the current fiscal year. Prototypes are now available for flight test and $28 million has been included in the FY 1966 budget to continue development, test and evaluation. The YF–12A incorporates the ASG–18/AIM–47A fire control and air-to-air missile system which has been under development for some years.

No decision on the production of the F–12A needs to be made now. If we were to decide to go ahead with deployment of an F–12A type aircraft, we would most likely produce an interceptor version of the larger SR–71 aircraft which has a considerably greater range than the YF–12A. This particular option would still be open to us in the FY 1967 budget period with no great cost penalty. Even so, the five-year systems cost of a force of F–12A's would amount to about $4 billion.

**Hawk.** Funds have also been included in the FY 1966 budget for the development of new components which would increase the capability of the Hawk surface-to-air system. . . .

**Advanced Air Defense System.**

. . . We have increased the FY 1965 program through reprogramming and we are requesting additional funds in the FY 1966 budget to continue advanced development.

**Airborne Warning and Control System (AWACS).** . . . we are reducing the effort on the aircraft system to a $3 million level in FY 1966. However, the problem is so important that we believe an additional $8 million in FY 1966 is completely justified to explore the extremely difficult technology of long range airborne radar for detection of aircraft against ground clutter.

**Ballistic Missile Warning and Defense.**

Defense against ballistic missile attack, whether from missile-launching submarines or land bases, comprises a capability both for warning and for tracking, intercepting and destroying the incoming warheads.

**Ballistic Missile Early Warning System.** . . . Last year we undertook major improvements to this system. About $20 million has already been provided for this purpose and another $9 million is included in the FY 1966 budget.

As I informed the Committee last year, we are modifying selected air defense radars on the East, West and Gulf coasts to give them some detection capability for shorter range missiles which might be launched from submarines, thereby providing at least a few minutes of warning. About $10 million has already been programmed for this purpose and another $10 million is included in the FY 1966 budget to complete the work. . . .

**Over-the-Horizon Radar.** . . . Additional funds are included in the FY 1966 budget to continue research and development and to procure equipment to augment the present system.

**Nike X.** . . . we propose to continue the development of the Nike X system on an urgent basis and a total of about $400 million has been provided in the FY 1966 budget for that purpose, including $10 million for some preliminary production engineering. We plan to reexamine the question of production and deployment of the Nike X system again next year. Considering the vast amount of development, test and evaluation work still to be accomplished, deferral of this decision to the FY 1967 budget should not delay an initial operational capability by many months beyond what we could expect to achieve if we were to start production in FY 1966.

**Anti-Satellite Defense.** Last year we were making certain modifications in the Nike-Zeus and Thor systems to give them a capacity within certain ranges to intercept and destroy hostile satellites. Both of these systems reached operational status last summer.

We are also proceeding with two large ground based optical installations for satellite tracking and photography. The first, at Cloudcroft, New Mexico, . . . will become operational shortly. . . . The second system, in Maui, Hawaii, will become operational in 1965 and should have an even higher resolution. Both systems, however, are subject to atmospheric distortions and are limited to periods near dawn or sunset.

## Civil Defense

. . . we intend to emphasize four aspects of the program during FY 1965 and FY 1966:

- Expansion of the present shelter survey program to include structures too small to qualify as public fallout shelters, i.e., small business facilities, duplexes and single family residences.
- Provision of architectural and engineering advice and assistance to stimulate the development of dual-purpose, low cost, fallout shelters in new construction or major structural modification projects, through the application of various design techniques.
- Development of plans to identify more precisely the residual shelter requirements and to ensure the efficient use of currently available shelter by matching individuals with specific shelter spaces.
- Provision of portable ventilation kits which will significantly increase the capacity of existing shelter space.

**Shelter Survey and Marking.** . . . $36.3 million has been included in the FY 1966 request for shelter surveys. Of this amount, $13.3 million is requested to support the continuing survey and marking program which, during FY 1966, should add about 6 million additional spaces to the inventory. . . .

In the case of single family homes, a pilot test using a questionnaire type technique is already underway. Many private homes, just as the larger structures covered by the National Fallout Shelter Survey, are presently capable of providing significant protection. The purpose of the "single family home survey" is to inform the homeowner of the existing protection already available to him. . . .

In total, $23 million is requested in FY 1966 for a full scale effort in these two new phases of the survey program.

**Shelter Development.** . . . We propose in FY 1966 to expand the provision of architectural and engineering advice on such matters to a level of $3 million. . . .

**Regional Operations Centers.** . . . eight regional centers have been planned. . . . The cost of constructing the remaining seven facilities on a more austere basis is estimated at $9.9 million, of which $2.1 million is already available from prior year appropriations. The remaining $7.8 million has been included in the FY 1966 budget.

**Shelter Provisions.** . . . $23.4 million is requested for FY 1966 to procure stocks for an additional 12 million spaces . . . . the FY 1966 request includes $3.6 million to defray the cost of modifying the water systems in some 18,000 buildings containing several million shelter spaces.

. . . includes $25 million for the procurement of portable ventilation kits which would substantially increase the capacity of existing non-ventilated shelter space. . . .

**Warning.** Of the $1.3 million requested in the FY 1966 budget for this category, $0.4 million supports the maintenance and improvement of the Washington area warning system. The remaining $0.9 million provides for fallout protection at an additional 228 State and local warning points in the national warning system. . . .

**Emergency Operations.** The $13.3 million included in the FY 1966 budget for emergency operations covers four activities—the Emergency Broadcast System, damage assessment, radiological defense and emergency operations systems development. . . .

**Financial Assistance to States.** . . . $30.5 million in matching funds are requested for FY 1966 for financial assistance to the States. . . .

### Research and Development.

The FY 1966 request includes $15 million, compared with $10 million for the current fiscal year, to expand the civil defense research and development program. . . .

### Management.

For overall program management, $14.6 million is requested for FY 1966. . . .

### Public Information.

The FY 1966 request includes $4 million for public information activities and for the encouragement of private industrial participation in civil defense activities.

### Training and Education.

For civil defense training and education, $15.5 million is requested in FY 1966. . . .

## Financial Summary

The Strategic Offensive Forces, The Strategic Defensive Forces and The Civil Defense Program I have outlined will require Total Obligational Authority of $6.3 billion in FY 1966. A comparison with prior years is shown below:

| | 1962 Orig. | 1962 Final | 1963 Actual | 1964 Actual | 1965 Est. | 1966 Proposed |
|---|---|---|---|---|---|---|
| | | ($ Billions, Fiscal Years) | | | | |
| Strategic Offensive Forces | 7.6 | 9.0 | 8.4 | 7.3 | 5.3 | 4.5 |
| Strategic Defense Forces | 2.2 | 2.0 | 1.9 | 2.0 | 1.7 | 1.6 |
| Civil Defense | | .3 | .1 | .1 | .1 | .2 |
| Total | 9.8 | 11.3 | 10.4 | 9.4 | 7.1 | 6.3 |

Survival supplies are shown being stored as part of a test of fallout shelter stocking procedure conducted by the DOD with the cooperation of local Defense Agencies.

Industrial fallout shelter entrance showing water-tight doors and seating and bunking arrangements typical of continuing Civil Defense shelter survey program.

# General Purpose Forces

The General Purpose Forces, as in the past, include most of the Army's combat and combat support units, virtually all Navy units, all Marine Corps units and the tactical units of the Air Force. These are the forces upon which we rely for all military actions short of general nuclear war, i.e., limited war and counter-insurgency operations.

## The Requirement for General Purpose Forces

While all of our military forces would be employed in a general war, it is primarily the limited war mission which shapes the size and character of the General Purpose Forces.

## Army General Purpose Forces

The United States Army, during the last four years, has undergone a major renovation and expansion. . . .

These changes have been so numerous and extensive and have come so fast that we believe the Army now needs a period of time in which to digest and consolidate them. Accordingly, we do not now propose any additional major changes in the Army force structure, except for a further realignment of the Reserve Components to increase their readiness to augment the active Army.

**Army Procurement.**

As you know, we have made very heavy investments in recent years in building up our stocks of weapons and combat consumables to levels which would permit our forces to engage in sustained combat. Under the logistics guidance which I described to you last year, the Army was to acquire initial equipment for a 22-division force (16 active and six reserve component divisions) plus sufficient combat consumables (attrition of equipment, replacement spares, ammunition, etc.) to maintain 16 divisions and their support forces in combat for the entire period between D-Day and the time when production rates could be built up to match combat consumption (P-Day). Now, with the reorganization of the reserve components, all of the Army National Guard units (including the two special purpose divisions, the separate brigades and other supporting forces) would be included within the force for which we buy weapons, equipment and combat consumables. We have added about $40 million to the FY 1966 request to make a start on filling the most urgent requirements—communications equipment, trucks, etc.

During the past year, we have continued to refine our inventory objectives for specific items of equipment in light of our most recent actual experience and in accordance with the logistics guidance just described. . . .

Our proposals also reflect our determined effort to concentrate funds for equipment modernization on those items which will yield the greatest gain in combat effectiveness. As now adjusted, the FY 1965 program totals about $1.9 billion; the proposed FY 1966 program amounts to about $2.0 billion.

**Aircraft.**

. . . for FY 1966, we propose only an austere aircraft procurement program, limited to meeting basic requirements which would not be affected by the outcome of the Army's study. A total of $344.5 million has been included in the FY 1966 budget for procurement of 1,018 aircraft (plus drones, spares and repair parts), . . .

**Iroquois.** Again the largest single item in the category is the purchase of UH–1D (Iroquois) helicopters. The Iroquois is replacing older helicopters and fixed-wing aircraft in the general utility role (e.g., transporting troops, cargo and casualties).

**Chinook.** . . . $75.2 million is included in the FY 1966 budget for continued procurement of this aircraft.

**Light Observation Helicopter (LOH).** Contracts for the FY 1965 portion of the light observation helicopter (LOH) program are soon to be awarded. $20.4 million for an additional 168 is included in the FY 1966 request. This new helicopter will be used to replace the older OH–13/23's and the O–1 fixed-wing observation airplane.

**Trainer Aircraft.** We also propose to procure 10 fixed-wing and 60 rotary-wing trainer aircraft in FY 1966, at a cost of $4.2 million.

**Missiles.**

Army procurement of missiles including spares will increase by $19 million, from $235 million in FY 1965 to $254 million in FY 1966.

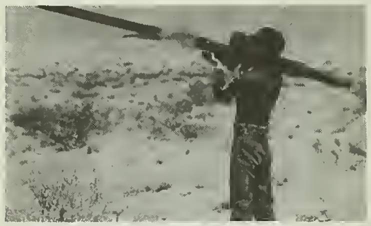
**Pershing.** The FY 1966 procurement of Pershing missiles would bring the Army's inventory to 100 per cent of its total inventory objective and provide for annual service practice and tests. During FY 1966, we will again be sharing the Pershing missile production with the Federal Republic of Germany.

**Lance.** . . . Funds have been included in the R&D request to provide for this development effort in FY 1966.

**Anti-Tank Missiles.** About $2.7 million is included for the procurement of SS–11 anti-tank missiles.

**Shillelagh.** The FY 1966 budget also provides $61 million for the first major procurement of Shillelagh missiles for use on the General Sheridan armored reconnaissance/assault vehicle. An additional $4.7 million will be required to complete development and testing of this command-guided anti-tank missile with the General Sheridan vehicle. In a related operational development project, we are requesting $3.5 million for further work on a new stabilized sight for Shillelagh and certain modifications, to extend its range.

**Redeye.** . . . For the Army, we propose to reprogram $21.8 million this year to start the production program and we request $58.3 million to continue procurement in FY 1966. . . .



**Hawk.** No additional Hawk or Hercules surface-to-air missiles will be procured in FY 1966. However, we are proposing to reprogram $34 million in order to procure Hawk equipment during the current year. Of this amount, $14 million is equired to build up stocks of equipment spares to more adequate levels. We are also requesting about $8 million in FY 1966 for certain high value repair parts and for continuing modifications of Hawk missiles presently in the inventory.

**Mauler.** No procurement is now anticipated.

**Sergeant.** The $1.9 million requested for Sergeant is required for warhead adaption kits.

**Missile Spares and Target Missiles.** About $16.7 million is requested for missile spares. Also included in the total for Army missiles is $6.0 million for target missiles. . . .

**Weapons and Combat Vehicles**

The $364.2 million FY 1966 request for weapons and combat vehicles is $108 million more than the $256.2 million now budgeted for FY 1965.

**20 mm. Gun.** We propose to replace the 50 cal. machine gun presently mounted on our M–114 armored command and reconnaissance vehicle with a 20 mm. gun. . . . After evaluating a number of candidates for this requirement, we have tentatively settled on the German-produced Hispano-Suiza. . . . It should be noted that, in view of our agreement with the Federal Republic, there would be no adverse balance of payments implications associated with this transaction since any "additional" expenditures we make in Germany are to be fully "offset" by German procurements from us.

**Howitzers and Light Recovery Vehicles.** The FY 1966 request provides $26.6 million for additional self-propelled 8-inch howitzers and M–578 light recovery vehicles, which will bring inventory levels for these items up to 100 per cent of the objectives.

General Sheridan. We are also proposing $58.2 million for the initial procurement of General Sheridan armored reconnaissance and airborne assault vehicles which will replace the M–41 light tank and the M–56 self-propelled 90 mm. gun in support of the field Army.

**Command Post Vehicles, Cargo Carriers and 81 mm. Mortar.** A number of standard tactical vehicles use the same chassis as the M–113 personnel carrier—including the M–577 command post carrier, the XM–548 cargo carrier and the M–125 self-propelled 81 mm. mortar. With the proposed FY 1966 program, we will have procured a large part of the objective for this family of vehicles, except for the 81 mm. self-propelled mortar, which completed development only a few months ago. Therefore, we propose to hold production of the basic chassis to the minimum sustaining rate so as to maintain the production base as long as possible. The FY 1966 increment includes command post vehicles, cargo carriers and 81 mm. mortar carriers at a total cost of $37 million.

**M–60 and M–48 Tanks.** Sufficient medium tanks (M–60 and M–48) have already been funded to meet our current logistics objectives. For the present, we have decided not to program the M–60, the current medium tank, for areas other than where there is a current or anticipated sophisticated armor threat. Nevertheless, we do wish to maintain, for as long as possible, the options to procure M–60's for other areas, to meet the tank requirements of friendly countries or to expand production quickly if the need arises. In order to maintain a hot production line through FY 1966 funding, we are requesting funds for a substantial number of M–60's. However, we do not expect that this procurement will raise our net total M–60 tank inventory above the desired level, inasmuch as tank sales to friendly countries over the FY 1965-66 period should amount to at least the FY 1966 quantity. The anticipated receipts from these sales have been used to reduce the total funding request for the FY 1966 Army program.

**Howitzers.** . . . We are also requesting $43 million for self-propelled 155 mm. howitzers.

**Tactical and Support Vehicles.**

About $315 million is provided in the FY 1966 proposed program for the procurement of almost 62,200 trucks, trailers and other non-combat vehicles, about 22,400 less than the number programmed in FY 1965.

**Tactical Trucks.** In terms of cost, the more important items in this category are some 40,000 tactical trucks for which about $253 million has been requested. . . .

**Communications and Electronics.**

We are requesting $240.1 million for the procurement of communications and electronics equipment in FY 1966. . . . Procurement for the Army Strategic Communications System, STARCOM, shows a substantial decrease in FY 1966—$46 million compared to $59 million in FY 1965.

**Radios and Communications Equipment.** About $84.5 million is requested for procurement of radios, with the AN/VRC–12 vehicular radio being the largest single item in terms of cost. Also included in our proposed FY 1966 program is about $14.3 million for the purchase of communications equipment. . . .

**Ammunition**

The FY 1966 request of $344.9 million is about $73 million more than the current year's level, although about the same as FY 1964 and FY 1963.

The largest single item, $44.6 million, is for the continued procurement of 155 mm. high explosive howitzer projectiles. We also propose continued procurements of several varieties of 105 mm. ammunition. For the 20 mm. gun previously mentioned, we propose to procure about $16 million worth of ammunition. Concurrently, we propose to establish a production facility in this country for this ammunition.

**Other Support Equipment.**

We are requesting $107.7 million for other support equipment. . . . These funds will be used for such items as electric field generators, road graders, cranes, tractors, bridge components, shop equipment, fork lift trucks, etc.

**Production Base Program.**

The $65.4 million requested for production base support is somewhat less than the amount programmed for FY 1965.

## Navy General Purpose Forces

During the past year we have continued our analysis of Navy General Purpose Forces requirements. . . . We now believe that some changes should be made in the programs which I presented to the Committee last year. Although there are still important uncertainties, we now find ourselves . . . to be generally in better shape than we previously thought with regard to anti-submarine warfare. Further improvements, however, are needed in the fleet's air defense and mine-clearing capabilities.

The fleet air defense problem is not new. Last year I . . . described the programs we were undertaking to improve further the existing ship-to-air missile systems (Tartar, Terrier and Talos), to develop a new standardized missile to replace Tartar and Terrier and to study a completely new ship-to-air missile system for the 1970's. These efforts are now well along.

The existing ship-to-air missile systems have been substantially improved in the last two and a half years. The "kill" probability and readiness rate of Terrier have been increased by a factor of two; similar, though less spectacular, improvements have been achieved in the case of both Tartar and Talos. The new standardized missile is well along in development and we plan to buy a number of missiles in FY 1966 for operational test and evaluation. The standardized missile, which uses the same launching systems, will gradually replace the Tartar and Terrier missiles on existing ships. . . .

Another general problem concerning the Navy's General Purpose Forces relates to the use of nuclear power for surface ships. As I stated last year, the key to solving this problem is the availability of a more economic power plant. Last summer the President approved the development of a new reactor, two of which could power an attack carrier. . . . The extent to which this new reactor would reduce the cost of a nuclear-powered attack carrier has yet to be determined, but I am hopeful that it will enable me next year to request the application of this reactor to the new carrier we tentatively plan to start in FY 1967. . . .

In total, we have planned a force of 868 Navy general purpose ships for end FY 1966, compared with 833 at end FY 1964.

**Attack Carrier Forces.**

**Ships.**

**Attack Carriers.** We have programmed a force of 15 attack carriers through FY 1969, the same number planned last year; however, the mix of carriers will be somewhat different. Last year we had planned to keep all three Midway-class carriers in the force, unchanged. We now propose to modernize two of these carriers, the Midway and the F.D.R. (The third Midway-class ship, the Coral Sea, has already been modernized.) The Midway will undergo modernization beginning in FY 1966. The F.D.R. will undergo modernization later. . . . The cost of modernizing both ships will be about $167 million. We are reprogramming $14.0 million in FY 1965 funds to procure long lead time items, and $70.3 million is included in the FY 1966 budget. It should be noted, however, that these costs will be largely offset by savings in aircraft procurement and operating costs. . . .

**Carrier Aircraft.**

The air complement of the attack carrier force currently consists of 15 carrier air groups and two replacement pilot training groups. You may recall I said last year that:

". . . Because of its greater endurance, longer radar and missile range, . . . the F–111B should offer a substantial increase in effectiveness over the F–4B and may replace them on less than a one-to-one basis."

A recent study of tactical air power concluded that the F–111B armed with the new Phoenix promises such large gains in combat effectiveness that, if the promises are realized, perhaps only one squadron will be required per carrier instead of one squadron of F–111B's plus one squadron of F–4's. . . .

We will continue to buy two types of attack aircraft, the A–6A which is especially designed for low-level bombing at night and in bad weather, and the A–7A (VAL), the new highly effective replacement for the A–4E which I described to you last year.

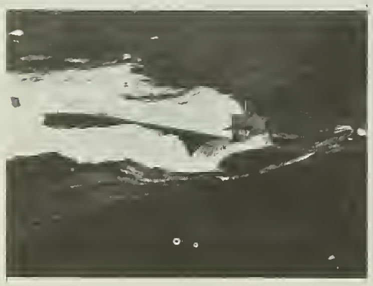
The number of reconnaissance aircraft in the carrier forces will also continue to increase over the next few years, reflecting the growing importance of this function. The program will provide six RA–5C's per Forrestal-class carrier. We have also included nearly $9 million in the FY 1966 budget to complete the project for extending the life of the RF–8A's, which will continue to be used aboard Essex and Midway-class carriers. . . .

**ASW—Surveillance and Ocean Patrol Forces.**

. . . the Navy has completed the first phase of a comprehensive study of anti-submarine warfare. Although I do not consider the work completed to date by any means conclusive, the preliminary results do present a more favorable picture than we had before, sufficiently so to permit some adjustment in the ASW programs I presented here last year. For a number of years we have given budget priority to new ASW ships and aircraft. Now we propose to give priority to the acquisition of better weapons and the improvement of sensors.

ASW Carriers (CVS). We now have nine CVS's, all Essex-class. These ships are still highly serviceable as ASW carriers, since they have the speed, range and space required for all ASW weapon systems now current or likely to be developed in the next few years. . . .

The ASW carrier forces will continue to be equipped with both fixed-wing and helicopter aircraft. We are now buying the S–2E long range search aircraft for the fixed-wing requirement and the SH–3A for the helicopter. As these aircraft are delivered they will replace the older types. We have also provided each carrier with a few A–4C's released from the attack carrier forces in order to give them a limited intercept and air defense capability. . . .



Attack Submarine Forces. By the end of the current fiscal year, the submarine forces, excluding Polaris, will number 104 ships including 23 nuclear-powered. . . .

How many submarines will be required in the future and how many should be nuclear-powered is not yet clear. By the end of the next fiscal year, we will have a total of 105 and we plan to maintain that general level through the program period. A total of 50 SSN's has already been funded (excluding the Thresher which was lost), and four more are included in the FY 1966 budget. . . .

**Destroyer Escorts.** There are now 23 destroyer escorts in the fleet. The first of the six DEG's (destroyer escorts armed with the Tartar missile), funded in FY 1962 and FY 1963, will be delivered to the fleet in early FY 1966. All six should be delivered by end FY 1967. A total of 55 DE's has been funded through FY 1965. . . .

Last year we cancelled our plan to convert 13 DD–931-class destroyers to Tartar missile ships for reasons which I have already discussed. All of these ships are less than nine years old, and they are fast enough to escort attack carriers. In their present configuration, however, they lack a standoff weapon and other modern ASW equipment. We can provide these ships with ASROC, improved communications equipment, a new variable-depth sonar and improved ECM capabilities plus certain minor structural modifications, at a cost of about $12 million each. With these improvements, the DD–931-class destroyers would be comparable to, or even better in the ASW role than, the DE's we are now building at the cost of about $27 million each. Accordingly, we have included $60 million in the FY 1966 budget for the first five of these conversions; eight more are scheduled for subsequent years. . . .

**Patrol Craft.** Subsequent to the enactment of the FY 1965 Defense Appropriations Bill, we requested approval to reprogram $7.9 million of FY 1965 funds to procure two hydrofoil patrol boats (PGH). This reprogramming action was not approved by all of the Committees involved. Instead, the Department was instructed to include the two PGH's in its FY 1966 budget, which we have done. In addition, the FY 1966 budget includes the ten patrol craft previously tentatively scheduled for procurement in FY 1966, making a total of 12. . . .

**Multi-Purpose Ships.**

There will be 263 ships which possess capabilities for both anti-submarine warfare and fleet air defense in the fleet at the end of the current fiscal year, the bulk of which will be destroyer types. A number of these ships—cruisers, frigates and destroyers—will have a guided missile capability. Seven guided missile frigates will be added to the fleet in FY 1966, including the nuclear-powered Truxton.

**Truxton.** . . . We now plan to program for surface ship modernization and for the development of the new missile system more than $900 million over the FY 1966-70 period, $54.6 million in FY 1966 for R&D alone. . . .

**Tartar and Terrier Missiles.** Another $108 million has been programmed in the FY 1963-65 period to improve the missiles themselves, and $39.6 million more is included in the FY 1966 budget to continue this work. As part of this effort, known as the SAM Improvement Program, we have undertaken the development of a new "standardized" missile for use with both Tartar and Terrier launchers. This new missile is being designed to achieve higher reliability with less maintenance, to provide a greater capability at a smaller cost per missile than either the Tartar or Terrier.

To provide for better fleet air defense in the 1970's, the Navy is currently studying an Advanced Surface Missile System (ASMS). Over $8 million is being spent this year, and $12 million is included in the FY 1966 budget to complete a project definition phase and to initiate systems development if it proves to be feasible. . . .

The first Terrier missile ships authorized—two heavy cruisers, three light cruisers and four frigates—were fitted with a system based on the beam-riding principle. Beginning this year, and continuing over the next few years, we propose to refit the four frigates and two heavy cruisers (at a cost of $201 million) with the more modern and effective Terrier homing system. . . .

**Mine Warfare Forces.**

The mine warfare force proposed for the FY 1966–70 period is essentially the same in size as that presented to the Committee for the past two years. . . . Additional new minesweepers (MSO's) will be constructed in FY 1966–

1968 (four in FY 1966) as replacements for older ships (MSC's) and one Liberty ship will be converted in FY 1966 to a Minesweeper Special (MSS). . . .

**Amphibious Assault Ships.**

. . . Our studies this year confirm that this revised program will significantly increase our amphibious lift and expand our helicopter vertical assault capability, provide for an orderly replacement of World War II ships and improve response time. A total of 15 ships is planned for construction in FY 1966 at a cost of $494 million.

In order to provide increased ship-to-shore firepower to "cover" the landing forces during an amphibious assault, we propose to reactivate during FY 1966 three Medium Landing Ships, Rocket (LSMR) and one Inshore Fire Support Ship (IFS) now in the reserve fleet. In addition, we now plan to retain in the fleet two Heavy Gun Cruisers (CA) which had previously been scheduled for deactivation. . . .

**Logistic, Operational Support and Direct Support Ships.**

. . . We are proposing construction of seven logistical and operational support ships in FY 1966 at a cost of $259 million, one less than planned last year. Construction of one of the two fast supply ships (AFS) previously included in the FY 1966 program has now been deferred to a later year, thereby leveling out the rate of construction.

In addition to the proposed ship construction program, we are also requesting $7.1 million in FY 1966 for the procurement of UH-46A helicopters. . . .

We also plan to construct two direct support ships in FY 1966, one Submarine Tender (AS) and one Destroyer Tender (AD), at a cost of about $117 million, to replace older, less effective ships. . . .

**Marine Corps Forces.**

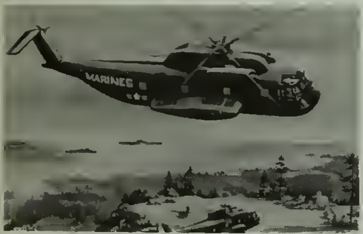
During FY 1966 and throughout the program period, the Marine Corps . . . will continue to maintain an active force of three combat divisions and three aircraft wings plus combat and support units. The Marine Corps Reserve has now been reorganized to provide a fourth division/wing team upon mobilization. . . .

To meet Marine Corps fighter requirements we will continue to buy the F-4 until all 15 fighter squadrons are equipped solely with F-4's armed with Sidewinder and Sparrow air-to-air missiles. We will begin to replace older Marine Corps F-4's with the newer models when they are released from the Navy as the F-111B becomes available.

For the attack squadrons, we will continue to buy the A-6A to provide the Marine Corps with an all-weather, close-air support and interdiction capability. We also plan to make our first buy of the new A-7A (VAL) aircraft for the Marine Corps in FY 1966.

. . . The first of the new RF-4B's will begin replacing the obsolescent RF-8A's in FY 1966. . . .

For the vertical envelopment mission, we are buying large quantities of CH-46A medium helicopters, a tandem rotor, twin turbine-powered helicopter with a normal payload of 4,000 lbs. or 17 men. . . . We are also buying smaller quantities of the CH-53A all-weather cargo and troop transport helicopter. First deliveries of the CH-53A will be made in FY 1966. . . .



**Navy and Marine Corps Aircraft Procurement.**

We propose to buy a total of 659 aircraft of all types in FY 1966 (at a cost of $1,545 million) to continue the modernization of the Navy and Marine Corps aircraft inventories.

To meet the fighter requirements of both the Navy and the Marine Corps, we will continue to procure the F-4, but at a lower level than in FY 1965. . . .

Last year we planned to procure our first increment of F-111B's in FY 1966. We have, however, encountered some development problems with the Phoenix missile. Since the system must be incorporated into the airplane, we have had to slip the aircraft production schedule and reduce the FY 1966 buy. Despite the delays in the Phoenix, we still plan for the first squadron of F-111B's to be operational on the previously scheduled date.

We are proposing to make our first major procurement of the A-7A in FY 1966 and we will continue to buy this aircraft over the next several years. Funds are also included in the FY 1966 budget for the continued procurement of the A-6A at the same level as in FY 1965.

. . . The E-2A program was initiated eight years ago in FY 1957, but the very difficult technical problems involved have yet to be solved. Because it is an important program, we believe it should be continued, but at a slower rate. We now propose to keep the production line going while we continue our efforts to solve the problems. Production of aircraft funded in FY 1963-1964 will be stretched over a longer period, leaving a smaller number of aircraft to be funded in FY 1966. $106 million of the $176 million provided for FY 1965 will be applied to the aircraft authorized through FY 1964, making a total through the current fiscal year of $970 million (including R&D). The remaining $70 million has been applied against the FY 1966 budget. The FY 1966 E-2A program will require $123.6 million in TOA—$121.2 million for aircraft and $2.4 million for continued development effort. . . .

As I indicated earlier, we intend to increase the number of patrol squadrons from 29 to 30. In addition, to make the P-2 available for the reserve forces and to modernize the 30 squadron force generally, we now propose to procure more P-3A aircraft than previously planned.

The FY 1966 budget also includes a total of 140 CH-46A, UH-46A and CH-53A helicopters for the Navy and Marine Corps, and a few C-2A carrier-on-board delivery aircraft. We had intended to complete our procurement of the C-2A in FY 1966 but, because of the recent slippage in that program, we have deferred part of our previously planned FY 1966 procurement.

In the trainer category, we propose to procure 91 aircraft in FY 1966. . . . we have reduced our procurement objectives for the T-2B. However, we now plan to procure a quantity of TA-4E's, a two-seat modification of the single-seat A-4E. . . . We have already reprogrammed with Congressional approval $58.5 million of FY 1965 funds to procure an initial increment of the TA-4E. $57.6 million is included in the FY 1966 budget for the second increment.

**Other Navy Procurement.**

. . . we are requesting about $761 million for Navy missiles, ordnance, ammunition and other combat consumables—an increase of about $114 million over the amount provided last year. . . .

**Sidewinder and Phoenix Missiles.** For the Sidewinder I-C (IRAH) missile, our objective is to keep a production line going until the new Phoenix missile begins phasing in. To accomplish this objective we plan to level off production at a rate which can keep the line going through the FY 1966 procurement period using FY 1965 and prior year funds. $71 million has been included in the FY 1966 budget to continue development of the Phoenix missile.

**Tartar and Terrier Missiles.** In addition to the Tartars and Terriers included in the FY 1966 procurement program, we plan to buy the first increment of the new "standardized" Tartar/Terrier missile which I mentioned before. These missiles will be used for test, evaluation and documentation. All future Tartar and Terrier procurement will be of the standardized model.

**Talos.** Funds are also included in the FY 1966 budget for the continued procurement of Talos.

Snakeye, Walleye and CBU–3. The current year's program for air-to-surface ordnance originally included Bullpup B short range supersonic tactical missiles. However, we now propose to cancel this buy since the Navy feels that assets accumulated through FY 1964 and previous procurements are sufficient, particularly in view of the substantial procurements now being made of the newer Snakeye, Walleye and CBU–3. The FY 1966 budget includes additional funds for the procurement of these three weapons.

MK–46. As I have pointed out in prior years, one of our most pressing needs in the ASW area is more modern weapons. In FY 1966 we propose to buy a large number of the new MK–46 light weight ASW torpedoes. . . .

SUBROC. The 1966 budget includes over $23 million for for SUBROC procurement. . . .

Sonobuoys. We have also included funds for increased procurements of sonobuoys—Julie, Jezebel, etc. We have already achieved 100 per cent of the inventory objective for Julie and are now buying for peacetime consumption.

**ASROC and DASH.** We will continue to procure substantial quantities of ASROC. . . . The FY 1966 increment will bring stocks to 100 per cent of the objective. Nearly $47 million is also included for procurement of DASH drone ASW helicopters. . . .

**Expendable Ordnance.** Recent, more detailed analysis . . . has caused us to increase our inventory objectives for three inch and five inch ammunition for ship guns. About $31 million has been included in the FY 1966 budget for these rounds. . . .

Procurement of expendable ordnance will be about $125 million above FY 1965.

**Electronics Procurement.** . . . Among the items being procured will be AN/SPS–48 three-dimensional radars (at a cost of $7.1 million). . . . We also propose to continue procurement ($21.6 million) for the Navy Tactical Data System. The Navy will also undertake an extensive program of in-service modification of existing sonars as part of the overall effort to raise ASW capabilities—at a cost of $20 million in FY 1965 and $33 million in FY 1966. In addition to improvements in AAW and ASW electronics equipment, the Navy has included $57 million in its FY 1966 procurement request for the second increment of its shipboard communications modernization program which I mentioned last year. . . . The Navy will also procure shipboard satellite terminals ($3 million) for use in connection with the Defense Communication Satellite Program.

Nearly $19 million is included in the FY 1965 Navy program for the procurement of automatic data processing equipment and an additional $6.3 million of equipment will be procured in FY 1966. Resultant reductions in rental costs are estimated at $1.6 million in FY 1965 and $5.4 million per year thereafter.

Marine Corps Procurement.

. . . A total program of $118.4 million is recommended for Marine Corps procurement in FY 1966, somewhat less than was provided for FY 1965. . . .

Ammunition. For 7.62 mm. ammunition, $5.0 million is requested. About $27.1 million is proposed for other ammunition and ordnance equipment, primarily for peacetime training.

Redeye. . . . For the Marine Corps, we propose to reprogram $10.0 million this year to begin procurement, and we are requesting $8.7 million in our FY 1966 budget to procure additional missiles.

Support Vehicles. The FY 1966 budget also includes about $25.6 million for the procurement of support vehicles, including 740 two and one-half ton and 600 five-ton trucks. $6.5 million is also included for the procurement of large amphibious assault fuel systems to support both the ground and aviation units of the landing force.

**Communications Equipment.** In the electronics category, the Marine Corps would buy, in FY 1966, a variety of radar, radio and other communications equipment including the new AN/TLG–17 electronic countermeasures set and the PRC–25 radio.

### Air Force General Purpose Forces

Because of the critical importance of tactical airpower to our position in Europe, we have made a major effort during the last four years to expand and modernize the Air Force General Purpose Forces and provide them with the wartime stocks needed for sustained non-nuclear combat. These objectives have been substantially attained. The chief remaining shortcoming is the excessive vulnerability of our forces overseas to conventional attack and we are again proposing a solution to that problem.

**Tactical Fighter Forces.**

We are continuing to program towards a tactical fighter force of 24 wings, the same size force we planned a year ago. However, I now believe we can prudently plan on a somewhat slower rate of modernization than we envisoned then.

The F–4 has proved to be a fine high performance, versatile aircraft; nevertheless, we do pay a price for this versatility and we should not buy more of these aircraft than we are likely to need. Based on our continuing study of tactical air power requirements and the great increases in capability, both realized in recent years and projected for the future, we now propose to reduce the tentative F–4 force objective by two wings. . . .

It is too early to project the ultimate F–111 force level and our objective for this aircraft is still tentative. . . .

With respect to Air Force tactical fighters, we will continue to procure the F–4 but at a lower level than in the current fiscal year. $395 million has been included in the FY 1966 budget for this aircraft. As I described last year, we are providing some of the later model F–4's with an improved air-to-ground attack capability and some with a low altitude intercept capability as well.

About $679 million has already been provided for the development of the F–111 and $205 million is included in the FY 1966 request. Last year, $146 million was provided for procurement of the first ten aircraft together with certain long lead time components. For FY 1966, $404 million is requested to continue procurement.

**Tactical Bombers.**

The two B–57 squadrons (48 UE aircraft), scheduled last year for transfer to the Air National Guard, were instead deployed for temporary use in Viet Nam. We now plan to retain these aircraft in the active force for as long as they are needed in Southeast Asia. . . .

**Tactical Reconnaissance Forces.**

No major changes are presently contemplated in the tactical reconnaissance force levels proposed last year although there have been some slippages and cost increases. The RF–4C program has continued to encounter delays and cost increases, resulting in a reduction of the FY 1964 and FY 1965 procurement programs. The $236 million requested for the RF–4C in the FY 1966 budget would make up those reductions and provide sufficient aircraft to enable us to maintain the planned force. . . .

**KB-50 Tankers.**

Last year we had planned on keeping one squadron of KB–50 tankers in the active force through the end of the current fiscal year. These aircraft, however, have proved very difficult to maintain in a safe operating condition and we decided to phase them out this year. KC–135 aircraft of the Strategic Air Command will be used to meet the tactical requirements for tanker support.

**Special Air Warfare Forces.**

The Special Air Warfare Forces at the end of the current fiscal year will reflect an increase over FY 1964. These forces presently include such aircraft as the B–26, the T–28, the A–1E, the C–46, the U–10 and the C–123. We plan to continue a force of approximately this size and composition throughout the program period. . . .

We have presently under development a new counter-insurgency aircraft called LARA (light armed reconnaissance aircraft) which will be optimized for lower orders of conflict where the requirement for transport dominates the need for fire power. . . .

**Other Air Force Procurement.**

**Shrike.** We have included in our FY 1966 budget request a total of $328 million for tactical non-nuclear ordnance (including $102 million for Special Air Warfare Forces), compared with $234 million for 1965 (including $76 million for Special Air Warfare Forces). Only about $100 million worth was procured in 1961. Included in the FY 1966 request is another increment of the anti-radar missile Shrike. . . .

**Bullpup.** Recent air-to-surface ordnance studies have revealed that Navy and Air Force stocks of Bullpup–A missiles presently exceed our likely needs. Therefore, rather than procure complete Bullpup trainer missiles for the Navy and Air Force, we will buy only the trainer inert center section for use with these excess Bullpup–A's. This will produce a net saving of $8.2 million in the current fiscal year. For FY 1966, 3,000 inert sections for these missiles will be bought at a cost of $1.2 million (compared with a cost of $9.4 million for 3,325 complete training missiles).

**Snakeye.** The Air Force will also buy $41 million of Snakeye 500 pound bombs in FY 1966. . . .

**Theater Air Base Vulnerability.**

As I noted at the beginning of this discussion of the Air Force General Purpose Forces, our most urgent need in this area is to reduce the vulnerability on the ground of our tactical aircraft deployed on bases overseas. . . .

With respect to the aircraft themselves, an earth-covered, steel shelter equipped with an armor-plate door has proved fully effective against strafing, napalm and fragmentation weapons and against near misses by all other types of non-nuclear weapons. These shelters would cost only about $110,000 each, a very small fraction (five to seven per cent) of the value of the aircraft they protect. The $22 million requested for the Air Force for FY 1966 would provide for that Service's highest priority requirements. In addition, we are requesting funds for a small number of shelters for Marine Corps aircraft.

Our analyses also underscore the present vulnerability of our deployed tactical air power to enemy attacks on the runways of our forward bases. . . . To meet this problem, the FY 1966 program provides about $5 million for the necessary equipment and material to create a rapid runway repair capability. . . .

**Tactical Exercises.**

Tactical exercises for elements of the General Purpose Forces, as I noted last year, serve many important objectives. . . .

For FY 1966, we again plan an extensive program of such exercises at an estimated cost of $130.9 million, compared with $110 million estimated for the current year.

Last July, I requested the Joint Chiefs of Staff to establish a joint task force to conduct tests of the penetration capabilities of our tactical and strategic aircraft and of our anti-air defensive systems. Joint Task Force Two has been formed and is now being manned. . . . Starting early in 1965 and continuing thereafter, JTF–2 will conduct comprehensive tests of existing and new tactical aircraft, weapons and ordnance, including penetration against all forms of air defense weapons. About $6 million has been included in the 1966 budget for the support of this effort.

## Financial Summary

The General Purpose Forces Program, which I have outlined above, will require Total Obligational Authority of $19.0 billion in FY 1966. A comparison with prior years is shown below:

|  | 1962 Original | 1962 Final | 1963 Actual | 1964 Actual | 1965 Estimated | 1966 Proposed |
|---|---|---|---|---|---|---|
|  |  |  | ($ Billions, Fiscal Years) |  |  |  |
| Total Obligational Authority | 14.5 | 17.4 | 17.6 | 17.7 | 18.1 | 19.0 |

The USS Sacramento (AOE–1), the first in a new class of large multi-purpose stores ships designed to accompany fast task forces, providing fuel, ammunition, missiles and general cargo. Sea Knight helicopters are aboard to provide airlift capability for a new concept of "Vertical Replenishment."

# Airlift And Sealift Forces

I believe that it is apparent from my discussion of the limited war problem and our General Purpose Force requirements that an adequate airlift and sealift capability is essential to our global strategy in the collective defense of the Free World. Included in the airlift forces which I will discuss in this section of the statement are the MATS transports, the Air Force Tactical Air Command troop carrier aircraft, and the transport aircraft in the Air Force reserve components. The sealift forces include the troop ships, cargo ships and tankers operated by the Military Sea Transportation Service and the "Forward Mobile Depot" ships.

### The Requirement

. . . it is clear that to meet the requirements for rapid movement of our forces, we need a new, very large capacity airlift aircraft and new "fast deployment" ships . . . .

Transport Aircraft.

Last year, I informed the Committee that we were studying the development of a new large transport aircraft, the CX–HLS (now called the C–5A). We were thinking then of a large aircraft in the 600,000 lb. class . . . with about 2,300 sq. ft. of loadable floor area using six of the C–141-type engines. We now believe that we can design an even more efficient and economical transport in the 725,000 lb. class, using four newly developed engines. This aircraft would be 15 per cent cheaper per ton/mile to operate than the model I described last year . . . and would have the same rapid loading and unloading drive-through features plus the ability to operate from short, low strengh airfields. Our studies during the last year have convinced us that unless troops and equipment can be routinely delivered well forward in the theatre of operations, many of the advantages of airlift would be lost. . . .

Even though the C–5A would be very expensive to acquire—$2.2 billion (including development and procurement) for a modest force of operational aircraft on a ten year systems cost basis (i.e., including the cost of development, procurement and ten years of operation)—the C–5A would be a much better buy than additional C–141's.

Our calculations show that it would be desirable to reduce the previously planned C–141 force by about one-third, and substitute C–5A's. The C–5A's would provide about the same capability as the replaced C–141's. Further, it is tentatively estimated that the ten year systems cost would be the same, even including the high cost of developing and procuring the new aircraft.

I have selected the figure of about two-thirds of the previously planned force as the point of departure for this calculation for several reasons:

- The C–141 is already in production. A total of 145 aircraft have been placed on order through FY 1965 funding.
- Assuming we can start full scale development of the C–5A by about July 1, 1965, the first operational aircraft would not be available for several years. We should not halt the buildup of our airlift between now and the time the the C–5A becomes available.
- A mixed force of C–141's and C–5A's would be desirable in any event since a variety of vehicles with different capacities more nearly produce a uniform matching of capabilities and requirements. The C–141 could carry the denser cargo, thus making fuller use of its payload potential, while the C–5A could carry the bulky cargo. Furthermore, there will always be trips which will not require the very large capacity of a C–5A.

### Ships.

Last year I informed the Committee that we were studying a new type of roll-on/roll-off ship which promised perhaps twice the capacity, greater speed and lower procurement and operating cost than the Comet-type ships we now have in the program . . . .

These ships would be powered by a new propulsion system consisting of a marine version of an aircraft-type gas turbine engine coupled to an electric generator/motor . . . .

Such a ship would be particularly useful for carrying, without disassembly, heavy wheeled and tracked vehicles as well as helicopters. Its relatively high speed would permit it to deliver cargo within the critical first 30 days, even from the continental U.S. to a distant area. We propose, however, to use these ships as Forward Mobile Depots stationed close to potential trouble areas and in no event for carrying peacetime cargoes . . . .

Although the ultimate mix of ships and aircraft has yet to be determined, the addition of a number of these fast deployment logistic ships and several squadrons of C–5A aircraft to the airlift-sealift forces should give us the capability to deploy large ground forces to distant areas. Accordingly, we propose to move forward both with the C–5A and the new fast deployment logistic ship programs.

### Airlift

Last year I told this Committee that we planned to undertake a number of studies to determine the characteristics of the CX. . . . We now propose to reprogram an additional $35 million from available FY 1965 funds to complete a very thorough and highly competitive project definition phase. . . . Another $157 million has been included in the FY 1966 budget for full scale development. The pacing components are the new power plant and the "high flotation" landing gear.

Additional C–141 aircraft will be procured in FY 1966 at a cost of $400 million and the final quantity will be bought in FY 1967 . . . .

### Sealift

The major change in the sealift program is the decision to go ahead with the construction of the new class of fast deployment logistics ships . . . .

Having completed our analyses, we now propose to start four of the new type fast deployment logistics ships in FY 1966 and have included $131.8 million in our budget request for this purpose . . . .

Since the new force of fast deployment ships would not be available for some years, we propose to convert more Victory's to forward mobile depots in FY 1966 and $29.6 million has been included in our budget request for that purpose . . . .

Although the tanker force will remain at 25 throughout the program period, we propose to increase the modernization program . . . . Last year we had planned to rehabilitate and lengthen four of these tankers, two in FY 1965 and two in FY 1966, and funds were requested and appropriated for the 1965 program. We still propose to convert two tankers in FY 1966 and, in addition, we have now programmed some more conversions in later years.

Our increasing dependence on airlift will undoubtedly require greater POL storage capacity in forward areas and increase requirements for tanker resupply . . . . To bring all of the major bases up to the desired on-hand level will require a long range program of construction and improvements. I have included $11 million in our FY 1966 military construction budget request for the first increment of this program . . . .

### Financial Summary

The Airlift and Sealift Forces I have outlined will require Total Obligational Authority of $1.6 billion in FY 1966.

|  | 1962 Original | 1962 Final | 1963 Actual | 1964 Actual | 1965 Estimated | 1966 Proposed |
|---|---|---|---|---|---|---|
|  | ($ Billions, Fiscal Years) |  |  |  |  |  |
| Total Obligational Authority | .9 | 1.2 | 1.4 | 1.3 | 1.5 | 1.6 |

# Research and Development

Included in this major program are all the research and development efforts not directly identified with elements of other programs. In my discussion of the mission-oriented programs—Strategic Offensive and Defensive Forces, General Purpose Forces, etc.—I have already discussed a number of the R&D projects. At this point I would like to round out in a more systematic fashion the contents of the R&D program. . . .

Within the Defense Department, the research and development program may be divided into five significant steps:

- Research—the effort directed toward the expansion of knowledge of natural phenomena and our environment, and the solution of problems in the physical, biological, medical, behavioral, social and engineering sciences.
- Exploratory Developments—the effort directed toward the expansion of technological knowledge and the development of materials, components, devices and subsystems which it is hoped will have some useful application to new military weapons and equipment. Here the emphasis is on exploring the feasibility of various approaches to the solution of specific military problems, up to the point of demonstrating feasibility with "breadboard" devices and prototype components and sub-systems.
- Advanced Developments—the effort directed toward the development of experimental hardware for technical or operational testing of its suitability for military use, prior to the determination of whether the item should be designed or engineered for actual Service use. Here is where we begin to identify each project with a specific military application or technique, and we begin to question in depth its potential military utility. During this phase we also begin to explore the costs of the most likely applications in order to determine whether the potential operational benefit would be worth the cost of development, production and deployment.
- Engineering Developments—the effort directed toward the development of a particular system engineered for service use and for operational employment, but which has not as yet been approved for production and deployment. It is at this point that large commitments of resources must be made to single projects. Accordingly, before full-scale development is initiated, the specific operational requirements and the cost effectiveness of the system must be confirmed, and goals, milestones and time schedules must be established.
- Operational Systems Developments—the effort directed toward the continued development, test, evaluation and design improvement of projects which have already entered (or have been approved for) the production-development stage.

The first three steps—Research, Exploratory Developments and Advanced Developments—constitute the area of new technology formation. The last two—Engineering Developments and Operational Systems Developments—cover the area of development, test and evaluation of specific new weapons systems and equipment. . . .

While research and exploratory developments do not necessarily have to be directly related to specific military requirements, a full scale engineering development or operational systems development can be justified only in terms of its potential contribution to our strategy, considering both its cost and its military effectiveness, as well as the relative cost/effectiveness of other alternatives. All too often in the past systems development work was started before consideration had been given to how the proposed weapon system would be used, what it would cost and, finally, whether its contribution to our military capability would be worth its cost.

Now before we embark on a major new weapon system development, we first conduct what we call pre-project definition studies. This is the phase during which we, together with our contractors, do our thinking and planning. These studies not only permit us to define the program more clearly, assess the technical risks and determine the estimated costs and time schedule before we finally commit ourselves to a specific full scale development, but they also help us determine how well a proposed system might contribute to the attainment of our military objectives. Most new developments promise, if successful, to achieve a capability that can also be achieved in other ways. Thus, it has always been true that the urgency of most projects is not so great as to prevent the employment of a measured and orderly approach to development and production. More important is the fact that, in most cases, careful and comprehensive prior planning saves time as well as money and results in more effective and dependable weapons.

This is not to say that we can wait until the requirement for a new weapon system is already upon us. The lead time from the initiation of engineering development to the operational deployment of a system is entirely too long to permit such an approach. We must, in fact, anticipate our requirements far into the future. However, in doing so, we must recognize that the further into the future we project our planning, the greater the uncertainties become. And these uncertainties involve not only the future course of technological progress but also what our adversaries may or may not do. Therefore, in certain critical areas we must develop major weapons systems even though we are not sure that they will ever be deployed, or that a military requirement will actually emerge. . . .

### Nuclear Testing and Test Detection

As I pointed out last year, the Defense Department has committed itself to four specific safeguards with relation to the test ban treaty.

- The conduct of comprehensive, aggressive and continuing underground nuclear test programs designed to add to our knowledge and to improve our weapons in all areas of significance to our military posture for the future.
- The maintenance of modern nuclear laboratory facilities and programs in theoretical and exploratory nuclear technology which will attract, retain and ensure the continued application of our human scientific resources to these programs on which continued progress in nuclear technology depends.
- The maintenance of the facilities and resources necessary to institute promptly nuclear tests in the atmosphere should they be deemed essential to our national security or should the treaty or any of its terms be abrogated by the Soviet Union.
- The improvement of our capability, within feasible and practical limits, to monitor the terms of the treaty, to detect violations and to maintain our knowledge of Sino-Soviet nuclear activity, capabilities and achievements.

This is, of course, a Joint Department of Defense-Atomic Energy Commission program. For the Defense Department's portion of this program for FY 1966, we have budgeted a total of $243.2 million. . . .

In support of the first safeguard, underground testing, we have included $28.5 million in the FY 1966 budget. . . .

In support of the second safeguard, maintenance of laboratory facilities and programs, our FY 1966 budget includes $53.0 million for nuclear weapons effects research and the Department of Defense's share of the cost of research, development, test and evaluation associated with nuclear weapons development. . . .

With respect to the third safeguard, maintenance of standby atmospheric test capability, we have budgeted approximately $47 million in FY 1966. . . .

In support of the fourth safeguard, the monitoring of Sino-Soviet actions, we have included a total of $114.5 million in the FY 1966 budget. . . . Two principal programs support this safeguard, the ARPA-VELA (Nuclear Test Detection) program and the Atomic Energy Detection System. . . .

### Space Development Projects

While the various elements of the Defense Department's space effort are spread, on a functional basis, throughout the program and budget structures, I believe this effort can be more meaningfully discussed as a separate entity.

The Defense space program, however, is an integral part of the much larger National Space Program, expenditures for which, as I noted earlier, now total about $6.5 billion a year. Without question this is the largest single scientific and technological endeavor ever undertaken by the American people. It will influence the course of science and technology and, therefore, our national security programs, for decades to come.

The Defense portion of this national program is designed (1) to explore the use of the space environment for military purposes, (2) to complement the work of NASA and other Government agencies in those fields in which the Defense Department has already achieved a high degree of technical competence and (3) to explore the usefulness of manned space systems for military purposes . . . .

I have laid down two fundamental criteria which the Defense space effort must meet. First, it must mesh with the efforts of NASA in all vital areas; that is, the Defense and NASA programs taken together must constitute a single, integrated national program. Second, projects supported by the Defense Department must hold the distinct promise of enhancing our military power and effectiveness.

With respect to the first criterion, we have established with NASA a large number of joint studies including the reviews of the launch vehicle program, manned earth orbital vehicles, communication satellites, weather satellites, instrumentation networks, control centers, etc. As a result, several formal agreements have been concluded—on research and technology exchange, satellite geodesy, gravity gradient tests, etc. The Aeronautics and Astronautics Coordination Board is the principal agency for effecting this coordination but key officials of both agencies meet very frequently to discuss and work out matters of common interest.

Thus, the Defense Department's program will continue to provide, together with the programs of other agencies of the Government, a broad base of technology and experience to permit the timely development and exploitation of space systems and capabilities which may be needed in the future, recognizing that lead times in certain areas such as manned military space operations may be ten years or longer. Speaking broadly, about one-half of the Defense space effort is directly associated with the unmanned military uses of space discussed above, while the other half is devoted to the creation of technology for future applications, i.e., exploratory and advanced developments. We can be sure that new discoveries and developments growing out of this effort will eventually open up entirely new applications and capabilities which cannot now be clearly foreseen. At the same time we pursue those efforts whose military applications are evident, we must also insure against an uncertain future by continuing to create a foundation of space technology, knowledge and experience which is sufficiently broad to provide for future applications as they materialize and are identified.

In total, we estimate that $1,670 million of our FY 1966 budget request is for space . . . .

**Spacecraft Mission Projects.**

. . . As a result of intensive studies carried out by the Air Force during the past year, we have reached several decisions regarding the future of the MOL program. These decisions were reached with full consideration of both NASA and Defense needs and in accordance with the agreement I reached with the Administrator of NASA in August 1962 to work toward a single national manned earth orbital R&D program.

As you know, we are participating in NASA's Gemini manned flight program to the extent of executing certain military experiments which are possible in the limited volume of that craft without degrading the primary flight objective. The $2 million requested in our FY 1966 budget will complete this participation. We are also providing a number of supporting functions for Gemini, including booster development, range and recovery support.

NASA's principal effort is the Apollo program with which I am sure you are familiar. The Apollo system for the lunar landing is planned to be qualified for a maximum of ten days flight time; however, NASA is also studying extensions of the system to provide for a longer stay on the lunar surface. We believe that the Defense Department, in meeting its own requirements in space, should take these existing and future capabilities fully into account. in accordance with the concept of an integrated national space program. And, this we have done in planning our own man-in-space program.

The Air Force and the Navy have carried out a number of both inhouse and industry studies to: (1) outline possible military functions for man in orbit; (2) define ground and space experiments to determine the effectiveness of these functions; and (3) design, in a preliminary way, spacecraft and supporting equipment required for the tests in space. Included were broad systems studies which emphasized the use of hardware already developed in the Gemini and Apollo programs, a study of a set of primary and secondary priority military experiments, a study of the ability of man to contribute to the assembly, alignment and service in orbit of large structures such as a telescope or radio antenna, and a study of the contribution which man in orbit could make to the technology of military space activities, whether the application was to be manned or unmanned.

On the basis of these studies and our discussions with NASA, we have concluded that the objectives of the MOL program should be broadened. The following primary objectives, listed in order of priority, have been established as a guide to future planning:

- Development of technology contributing to improved military capability for manned or unmanned operation. This may include intermediate steps toward operational systems.
- Development and demonstration of manned assembly and servicing in orbit of large structures with potential military applications. This will interact strongly with the preceding objective.
- Other manned military space experimentation.

These primary objectives of MOL are essential military objectives and will, therefore, be pursued by Defense. In addition, MOL program planning will consider the following "national" objectives of scientific significance:

- Basic scientific and general technological manned experimentation.
- Development and demonstration of manned assembly and servicing in orbit of large non-military structures, such as astronomical telescopes and radio antennae for scientific use.
- Biological responses of man in orbit for 30 days or more. . . .

There are a number of possible equipment configurations which could provide a system with these characteristics, including an adaptation from the Gemini or Apollo programs where this can be done without interfering with the national lunar objectives. The choice should be made on the basis of effectiveness, timeliness and cost. No new hardware should be developed unless necessary.

Accordingly, we have adopted the following course of action:

- The Air Force will define the experimental program to meet the broadened military objectives, placing emphasis on developments that may lead to operational systems. The Air Force will determine the essential vehicle characteristics to meet those objectives and, in cooperation with NASA, will define significant additional experiments addressed to the national objectives.
- The Air Force will assess the proposed specifications of a MOL system (Gemini B, laboratory and Titan IIIC) against the needs of the experimental program. Three preliminary design studies will be initiated with industry, using FY 1965 MOL funds, to provide the cost and technical information needed to select the final configuration. The Air Force will also examine approved configurations of the Apollo system and, in cooperation with NASA, will examine the modified configurations of the Apollo system now being studied by NASA to meet its objectives.

- To preserve the option for proceeding with MOL on an orderly basis and to make effective use of the Titan III R&D flight program, action will be taken (using FY 1965 funds) to qualify components of the Gemini B plus laboratory configuration aboard Titan IIIC approved development vehicles. (No men will be carried on these flights.)

- One hundred fifty million dollars has been included in the FY 1966 budget request for continuing the design studies, narrowing the effort to two contractors for program definition and a single contractor for subsequent full scale development. The study contractors to be selected in FY 1965 will be chosen on the basis of their ability to execute development, whether the approach finally selected is the Gemini B or a version of the Apollo system. However, the FY 1966 funds will not be obligated until we are convinced that a satisfactory approach has been found and that the expected results of the program will be commensurate with the cost.

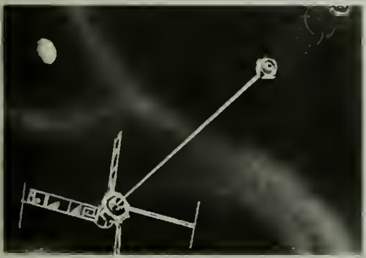
Project "Gemini (Manned Space Flight)" represents the Defense Department's participation in the NASA-Gemini program. . . . The $2 million requested for FY 1966 will complete this project.

I have already discussed "Nuclear Test Detection (VELA)" in connection with the Test Ban Treaty safeguards. Twenty-two million dollars is included for this program in the FY 1966 budget.

Last year I informed the Committee that we were actively exploring the possibility of securing satellite communication services through the system which the new Communications Satellite Corporation was planning to build and operate. . . .

Sufficient funds are available for the completion of the initial system's space elements which are the responsibility of the Air Force. However, in addition to $18 million of prior year funds, the Army will require an additional $2 million in FY 1966 for further development of the ground stations; $3.5 million will be required for overall systems management which is the responsibility of the Defense Communications Agency; and $9 million will be needed for the Navy element of the system.

The Navy navigational satellite system will require $22.9 million in the FY 1966 budget. This system, which reached full operational status in July 1964, is designed to provide, under all weather conditions, navigational fixes on any point of the earth's surface. Although the development phase of this program is substantially completed, some research is continuing to improve the life and reliability of the satellite. Of the $22.9 million included in the FY 1966 budget, $7 million is for this purpose. The remaining $16 million is for annual operating costs including the purchase of launch vehicles required to replace inoperative or dying satellites. . . .



#### Vehicle, Engine and Component Developments.

The largest item in this category is still the "Titan III." . . . Designed to serve NASA as well as Defense Department purposes, Titan III will be a standardized launch vehicle for a wide range of manned and unmanned missions. . . .

Although progress to date clearly indicates that development could be completed by June 1966, a decision has been made to stretch out the basic Titan III development program schedule to June 1967. The purpose of this stretchout is to assist in maintaining a Titan IIIC production and launch capability for the various "user" programs which will not require the Titan IIIC until calendar year 1967. It will not affect the three initial Defense communication satellite payloads currently assigned to three of the Titan IIIC development flights. The follow-on Defense Communication Satellite and probably the MOL are expected to use the Titan IIIC once vehicle development is complete.

The cost of the basic TITAN III R&D program to completion should be between $880 and $890 million. . . .

The FY 1966 budget includes $35 million for "Reentry and Recovery (START)" projects. . . .

The next item is "Advanced Space Guidance" for which $10 million is requested in the FY 1966 budget. This effort, formerly titled "Standardized Space Guidance," is now being carried as an Advanced Development program. . . .

The $6 million included in the FY 1966 budget for "Solid Rocket Engine Development" will complete Defense Department participation in the national large solid fuel booster development program. . . .

Last year we initiated a new "Liquid Rocket Engine Development" program, designed to demonstrate the feasibility of the modular approach to large rocket engine development. . . . The FY 1966 budget includes $8 million to continue this work.

The next item, "Chemical Rocket, Space Maneuvering," is a new program for which $7 million is requested for FY 1966. This program will provide a space maneuvering capability for possible near term application as well as demonstrated propulsion components for future needs. This system will be capable of efficient multiple re-starts in a space environment limited only by the availability of propellants.

#### Other Defense Activities Supporting the Space Program.

The Ground Support category includes the prorated cost of the missile ranges and test instrumentation as well as the satellite detection and tracking systems. The largest item in the category is the $116 million for the Eastern Test Range. . . .

The FY 1966 budget includes $40 million for SPACETRACK and $6.8 million for SPASUR.

The $30.2 million requested for "Satellite Tracking and Control Facilities" will continue the modernization of the network of six tracking stations and one control center which provides an "on-orbit" tracking, command, control data "read-out" and recovery for all Defense space vehicles except those of the Communications Satellite (COMSAT) and Navigational Satellite programs. . . .

### Research

. . . In addition to its own inhouse laboratories, the DOD supports nearly half of all the academic research in the physical sciences and engineering now being done in American universities and colleges. . . . We have therefore included in our FY 1966 request a total of $387 million for research. . . .

#### Exploratory development.

During this stage of research and development, we approach the solution of specific military problems up to the point of developing hardware for operational testing. Along with research, exploratory development forms the pool of technical knowledge from which future weapons systems will be devised and designed. A total of $1,142 million has been included in our FY 1966 budget. . . .

#### Army

The Army's exploratory development effort, for which $254 million is included in the FY 1966 budget, provides for studies and analyses and fabrication, test and evaluation of various components to establish their feasibility, practicability and relative advantages for use in future major development programs. This effort includes: components for new infantry close-support artillery and air defense missile systems; new and improved propulsion systems for Army aircraft; applied research in rocket propellants; work on new power sources and energy transformation devices; new, lighter, improved ground surveillance and target acquisition techniques; improved designs and materials for small arms and armor defeating projectiles; nuclear weapons effects as applied to Army equipment; applied research directed toward improved surface mobility, particularly in remote areas; mine warfare and barrier research; and mapping and geodetic research directed toward overcoming the limitations of current equipment and techniques with respect to speed and extent of area covered.

**Navy.**

The Navy's exploratory development effort is planned to produce improved "know-how" for the performance of all important naval functions. Included are the detection and localization of underwater, surface, and air targets; environmental surveillance with emphasis on the air-ocean interface; navigation; command-control; weaponry; ship and aircraft construction; and personnel and logistics.

The overall program on surveillance and command-control includes work on radar, ASW detection devices, jamming devices, data correlation techniques, navigation devices, communications, etc., for both ships and aircraft. In the field of ordnance, emphasis will be placed on nonnuclear air launch systems. Missile propellants, guidance systems and countermeasures will also be studied. Several projects involve advanced aircraft concepts, with emphasis on simplicity, endurance and low-speed characteristics. Work related to ships and submarines will concentrate on hull structures, integrated controls, and fatigue characteristics of deep-diving submarines, as well as advanced propulsion systems (including nuclear) and measures to reduce underwater noise levels. About one-third of the $342 million requested for the Navy in FY 1966 will be devoted to problems directly related to ASW.

**Air Force.**

About one-fourth of the $316 million requested for the Air Force's FY 1966 exploratory development program will be devoted to space or space-related subjects. Included are studies, experimentation and component developments in such fields as guidance, flight control, propulsion, life sciences, and electromagnetic techniques.

In other areas, emphasis will be given to improving technology related to advanced tactical and strategic missiles, new propulsion cycles for hypersonic manned systems, over-the-horizon radars, V/STOL aircraft, the feasibility of laminar flow control in supersonic flight, new materials and structural concepts, technology related to communications, command and control, intelligence techniques, computer and data processing, electromagnetic techniques and advanced weapons.

**Advance Research Projects Agency (ARPA).**

A total of $230 million is included in the FY 1966 program for ARPA's exploratory developments projects. . . .

Project Defender. We have included $127 million for Project Defender, which is concerned with the development of the scientific and technical knowledge needed for the design of U. S. defenses against ballistic missiles and satellites, and for the assessment of the ability of U. S. ballistic missile systems to penetrate enemy defenses. . . .

Project Vela. I have already discussed this project in connection with the Test Ban safeguards program. $59.3 million has been included in the FY 1966 budget to continue this work. . . .

Project Agile. This project is designed to provide research and development support for the solution of remote area conflict problems with primary emphasis on requirements of indigenous forces in guerrilla warfare situations. Agile is but part of a much larger effort in counterinsurgency warfare research for which a total of about $160 million has been included in the FY 1966 RDT&E budget. . . .

## Advanced Development

This category includes projects which have advanced to a point where the development of experimental hardware for technical or operational testing is required prior to the determination of whether the items should be designed or engineered for eventual service use. In contrast to engineering developments where design specifications are employed, advanced developments permit the use of performance specifications which provide the contractor much greater latitude in meeting the requirement, thereby encouraging innovation. . . . To encourage innovation, we plan to expand the value of advanced development projects from $572 million in FY 1965 to $828 million in FY 1966, partially at the expense of engineering developments.

**Army.**

The first two items on the Army list of advanced developments—"Operational Evaluation V/STOL" and "New Surveillance Aircraft"—are both part of a broader Defense Department program for the development of experimental prototype vertical, or short, take-off and landing aircraft suitable for operational testing by the three Services. Both of these projects have heretofore been funded on a tri-Service basis. The first was formerly known as the "Tri-Service V/STOL Aircraft" program and was funded, roughly, one-third by Army, one-third by Navy and one-third by Air Force. It actually encompassed three separate V/STOL developments—the XC–142A and X–19A managed by the Air Force and X-22A managed by the Navy. The second, the "New Surveillance Aircraft," was funded one-half by Army and one-quarter each by the Navy and Air Force and also encompassed three separate developments—the P–1127 Hawker, the XV–4A and the XV–5A—all managed by the Army. These financing arrangements have proven to be unduly cumbersome and beginning in FY 1965, each project is being funded by the managing agency; the FY 1966 budget has been prepared on this basis. Accordingly, only a nominal amount is requested for the Army in FY 1966 to participate in the Tri-Service evaluation of XC–142A, X–19A and X–22A.

The XC–142A is the largest of the three projects with a total estimated cost of $120 million for five test aircraft. . . . Further technical and operational evaluation will be conducted on all five aircraft during the balance of FY 1965 and through FY 1966. . . . The X–22 is a twin tandem tilting duct fan-powered flight research vehicle. Two prototypes are being built at a total estimated cost of $32 million with the first flight scheduled for July 1965. . . .

The X–19A is another research aircraft with twin turbines and four tandem tilted propellers. Two prototypes are being procured at an estimated cost to the Government of $14 million. The first flight was made in November 1963 and flight testing will continue through FY 1966.

The largest development in the New Surveillance Aircraft program, for which $7 million has been included in the FY 1966 budget, is the XV–6A (P–1127 Hawker), a British designed light weight V/STOL strike-reconnaissance aircraft. . . . The U. S. share of the cost is estimated at about $38 million, including approximately $6 million in FY 1966. . . .

In addition to the P–1127 program, the U.S. is participating in several cooperative R&D programs with Germany and France which provide for an exchange of technical data on V/STOL technology. The German and French V/STOL projects incorporate variations in airframe and propulsion designs which have not been duplicated in the United States.

The XV–4A, the second development under the New Surveillance Aircraft program, is an augmented jet lift design. Two research aircraft have been built at a cost of $4.2 million. . . . One aircraft was lost in the summer of 1964 but flight testing is continuing on the second aircraft.

The XV-5A, the third development under the New Surveillance Aircraft program, is a fan-in-wing design. . . . Two prototypes are being procured at a cost of $16.1 million. Flight testing will continue through FY 1966 .

Including the Navy and Air Force V/STOL projects, a total of about $79 million is included in the FY 1966 budget for this program. . . .

The next item is the "Heavy Lift Helicopter" which was started in FY 1963 with the purchase of six off-the-shelf, heavy lift "flying crane" type helicopters. . . . The $3 million requested for FY 1966 is to continue field evaluation of the six helicopters.

For "Aircraft Suppressive Fire Systems," $4 million is included in the FY 1966 budget. . . .

The "CCIS for Field Army" is a command and control information system. . . .Considerable progress has already been made in two areas—intelligence and fire support—and the $13 million requested for FY 1966 will support work in the other three areas and will be used to develop more efficient automatic data processing equipment and communication. . . .

The "DOD Communication Satellite, Ground," is the Army portion of the Defense Communications Satellite Program for which $20 million is required for FY 1966. . . .

**Navy.**

The first two items in the Navy list of advanced developments represent the Navy's participation in the DOD V/STOL development program. The $5 million requested for "V/STOL development" is to continue work on the X–22, which is now being completely funded by the Navy. No funds are requested in the Navy's budget for "P–1127 Hawker" which is now being entirely funded by the Army.

The $6 million requested for "Advanced Aircraft Engines" is for a new program designed to demonstrate the technical feasibility of a high thrust-to-weight ratio, turbo-fan engine, including thrust deflection and augmentation systems. Such an engine would have a wide application to V/STOL and conventional general purpose attack aircraft in both the subsonic and supersonic regimes.

. . . the "Advanced SAM System," for which $12 million is requested in FY 1966. This is the surface-to-air missile system which we hope will eventually replace the Terrier, Tartar and Talos. . . .

The "Advanced Anti-radiation Missile System," for which $6 million is requested in FY 1966, is contemplated as a follow-on to the Shrike missile. Although the Navy will do the work on the subsystems, this missile development is also of interest to the Army and Air Force.

The $5 million requested for the "Advanced Sea-based Deterrent" project would continue a broad program of investigation and applied research focused on possible configurations of future sea-based strategic systems from which an advanced weapon system may eventually evolve.

The $13 million requested for "Astronautics" in 1966 includes $6 million for the Navy's portion of the Defense Communications Satellite program and $7 million for satellite geophysics (Project ANNA). . . .

For ASW RDT&E, we have included in the FY 1966 budget a total of $386 million, $121 million under Advanced Developments.

The first item in this group, for which $5 million is requested in 1966, is "Artemis/Underwater Acoustics," a large scale experimental effort in the long range detection of enemy submarines by active means. . . .

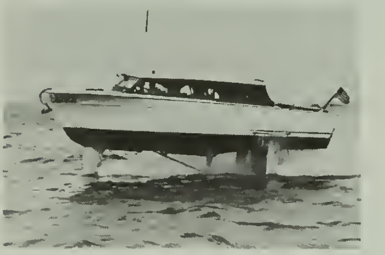
The second project in this group, Trident, comprises a number of advanced development efforts in submarine detection. $4 million dollars is requested in FY 1966 to continue this project.

The next item, "Airborne ASW Detection Systems," for which $21 million is requested in FY 1966, includes a number of related projects. . . .

"Advanced Submarine Sonar Development." Project definition results will be evaluated in FY 1966 and development contracts will be awarded later for the design fabrication and testing of developmental models.

The "Advanced Surface Sonar" project involves two major efforts. The first sonar would have a passive and active detection caapability many times greater than our present sonars. The second effort will provide increased detection, range and classification capabilities for the existing AN/SQS–23 sonar.

The next project, for which $5 million is requested for FY 1966, was initiated this year and is designed to develop a means of increasing the capabilities of our ASW torpedo homing systems.



The $2 million requested for "Hydrofoils" in FY 1966 is for the evaluation of the 110 ton 45 knot patrol craft already completed and the 320 ton 50 knot hydrofoil auxiliary ship to be completed late in 1965. The evaluation effort will concentrate on hydrodynamic structure, propulsion and control systems in order to determine the utility of these ships in the ASW and other roles.

One of the important efforts being greatly expanded in FY 1966 is the "Deep Submergence Program" for which $18 million is requested. . . .

The program "Reactor Propulsion Plants," for which $20 million is requested in FY 1966, covers two major projects. One of these is directed to the development of a nuclear power plant which would provide a quieter, safer, more reliable propulsion plant for submarines. This project will require $6 million in FY 1966. Results of work conducted under the second project, originally directed to the development of a smaller, less expensive single reactor power plant for frigates and destroyers, have established the feasibility of a power plant with a very long fuel life. Since two such reactors could produce as much power as four of the reactors on the Enterprise, we have asked the AEC to develop a nuclear propulsion plant for possible use on the attack carrier tentatively planned for the FY 1967 shipbuilding program. The $14.2 million requested for this project would complete the Navy's share of the development (propulsion plant machinery as opposed to the reactor development of the AEC), and would provide for testing certain prototype components.

"Propulsion Development Sea Hawk," for which $14 million is requested in FY 1966, will concentrate on the development of a combined gas turbine propulsion system for ASW ships. . . .

The $1 million requested for the "ASW/Ship Integrated Combat System" in FY 1966 is to investigate the cost and feasibility of developing a single system which would integrate command control with the control of weapons and the sonars.

**Air Force.**

The first four items on the Air Force list of advanced developments are all part of the V/STOL aircraft technology program discussed earlier.

The $8 million requested for "Tri-Service V/STOL Development" will continue operational evaluation of the XC–142, the XC–142A and the X–19A.

The $8 million requested for "V/STOL Aircraft Technology" provides for the test and evaluation of various domestic and foreign V/STOL concepts and equipments with a view towards eventual design of an operational V/STOL fighter-type aircraft. Included in this evaluation are the British Hawker P–1127, the French Mirage IIIC and the German VG–101 and VAK–191B.

The $30 million requested for "VTOL Engine Development" encompasses two separate types of engines—one, a pure lift engine and the second, an engine which can deflect its thrust to produce lift during take-off and landing and also be used for forward propulsion. . . .

The fourth project on the list, $10 million for a "Light Weight Turbojet," is essentially to demonstrate the technology for light weight turbo engines for various purposes including V/STOL. . . .

The next two projects, "Overland Radar" and "AWACS," are closely related. The first, for which $8 million is requested in FY 1966, concerns the development of the radar technology which would be needed in the development of an airborne warning and control system (AWACS). . . . The $3 million requested for AWACS would initiate systems development at a slower rate compatible with the integration of the aircraft and the radar.

For "Tactical Fighter Avionics," $31 million is requested for the development of an advanced air-to-air and air-to-ground delivery capability. . . .

The $10 million requested for "Reconnaissance Strike Capability" is to develop and demonstrate a capability with multiple high-resolution sensors such as side-looking radars, for both the Strategic and the General Purpose Forces.

The $10 million requested for the "Close Support Fighter" is to (a) evaluate existing aircraft such as the A–4, A–6, A–7 and F–5 for the close support role and (b) cover the cost of modifying one of these types of aircraft for the Air Force close support mission. . . .

The FY 1966 budget includes $6 million to continue the X–15 project. This rocket powered research aircraft . . . is now being used as a "test bed" aircraft for a group of advanced experiments in aeronautical and space sciences. . . .

The $5 million requested for "Tactical Missile Guidance Development" would provide for the fabrication and testing of several homing and tracking guidance heads. . . .

To wrap up the Stellar Inertial Guidance project which was originally undertaken as part of the M/MRBM development program, $1 million will be needed in FY 1966. . . .

The FY 1966 budget includes $5 million for continued study of the various technological and operational concepts for an "Advanced ICBM," and $6 million to continue work on "Low Altitude Supersonic Vehicles". . . .

## Engineering Development

This category includes those projects being engineered for Service use, but which have not as yet been approved for production and deployment.

**Army.**

. . . The "Nike-Zeus testing" program will be completed during the current fiscal year and all further testing will be taken over by the Nike X program. The $407 million requested for "Nike X" will continue, on an urgent basis, the development of that new system including the multi-function phased array radar (MAR), the missile site radar (MSR), high speed data processing equipment, the Zeus missile and the high acceleration Sprint missile.

The $10 million requested for "Forward Area Air Defense" will be devoted to the further analysis of the forward area air defense problem created by the disappointing results of the Mauler development program. . . .

The funds requested in FY 1966 for the "Division Support Missile (Lance)" will substantially complete system development. . . .

$64 million is requested in the FY 1966 budget to continue engineering development of a variety of other weapons. Included in this category is the development of the Special Purpose Individual Weapon (SPIW) as a possible replacement for the M–14 rifle and the M–79 grenade launcher. Another item in this category is the 107 mm. mortar being developed as a replacement for the current 4.2" mortar. . . .

The next two items, "Aircraft Suppressive Fire Systems" and "Advanced Aerial Fire Support Systems" are closely related. The former, for which $15 million is requested, is concerned with the development and adaptation of weapon sub-systems for aircraft. . . .

The latter project, for which funds are also requested, would initiate the development of a completely integrated armed "helicopter-like" system as a replacement for the present improvised armed HU–1B system. . . .

The $2 million requested for Tactical Transport Aircraft is to complete development of the CV–7 (Buffalo). This airplane is being developed jointly by the U. S. and Canada for Army use. . . .

The $18 million requested for "Combat Surveillance and Target Acquisition" includes a number of different projects: ground radar for detection of moving vehicles and personnel; sound and flash ranging equipment for locating hostile weapons; image interpretation and photo processing equipment; and an unmanned aerial surveillance system. . . .

The $25 million requested for "Communications and Electronics" will finance the development of tactical radios, automatic electronic switchboards and air traffic control systems.

The FY 1966 budget request for the "Heavy Anti-Tank Missile (TOW)" should substantially complete the funding of this development. The FY 1966 funds requested for the "Main Battle Tank" will provide for the U. S. share of the tank component development cost covered by the joint U. S./FRG tank development cost sharing agreement, the project management costs for the Main Battle Tank development which are not covered by the agreement, and certain other tank development costs.

**Navy.**

The first five items on the Navy's list of engineering developments are all associated with undersea warfare and, in total, amount to $65 million in FY 1966.

. . . The $4 million requested for "ASW Ship Command and Control System" will continue modification of computer and display equipment developed under the Navy Tactical Data System program. . . .

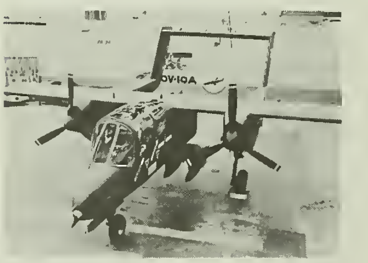
The largest single item in this category is the amount requested to continue development of the "MK–48 Torpedo" which I discussed earlier in connection with the Navy General Purpose Forces.

The FY 1966 budget includes $4 million for "ASW Rockets." . . . Project definition is planned for FY 1966.

The $16 million requested in FY 1966 for "Marine Corps Developments" includes: an amphibious assault personnel carrier capable of transporting infantry weapons and supplies through very rough surf in the assault phase of an amphibious operation; a landing force amphibious support vehicle for rapid movement of supplies and equipment from ship to shore and over land; and light weight, helicopter-transportable, high performance ground radars.

The regenerative turbo prop engine development for ASW aircraft, which was described in this section last year under the heading "Aircraft Engines," is to be shelved following completion of the hardware, without going on to pre-flight test rating. . . .

The last item, "Special Warfare Navy Aircraft," is the new light armed reconnaissance airplane (LARA), designed primarily as a combination weapons delivery-logistics, primitive area STOL air support vehicle for counterinsurgency operations. . . . The total cost of the program is estimated at $18 million to be completed with the $6 million requested for FY 1966.



**Air Force.**

I have already discussed most of the Air Force engineering developments in connection with other programs.

The $25 million shown for the "XB–70" in FY 1966 will complete the funding of that project. . . .

The next item, "Advanced Manned Aircraft," encompasses studies on the airframe, the development of advanced avionics and design and demonstration of the new power plant required by advanced aircraft, including strategic bombers. Last year the Congress appropriated a total of $52 million for the development of an advanced strategic manned aircraft. Of these funds, $28 million will be used in FY 1965 and the remaining $24 million in FY 1966, leaving $15 million in new obligational authority needed next year.

The development of a new "Short Range Attack Missile," which could be used with the B–52 as well as with a new strategic and other advanced aircraft, will begin this year. . . . $37 million more is requested for FY 1966 to continue this work.

The next item on the Air Force list is the "YF–12A" for which $28 million is requested for FY 1966. Of this amount, $5 million will be used to continue work to improve the ASG–18/AIM–47A fire control and air-to-air missile systems. . . .

Substantial funds are requested in the FY 1966 budget for continued development of "Advanced Ballistic Missile Reentry Systems." . . .

For "Nike/Zeus Targets" to support the Nike X development program, $9 million is requested for FY 1966.

No additional funds are being requested for the "M/MRBM," which is being dropped from the development program. . . .

## Management and Support

Army.

For the support of White Sands Missile Range, one of the national ranges used by all Government agencies, $88 million is requested. . . .

At the beginning of the current fiscal year, the Army assumed full responsibility for the Kwajalein Test Site, providing essentially the same range support as previously provided by the Navy.

The $199 million requested for General Support covers the costs of all Army R&D installations and activities other than White Sands and Kwajalein. . . .

Navy.

The Pacific Missile Range with headquarters at Point Mugu, California, is responsible for range scheduling, communications, weather and meteorological services and data reduction in support of all sea-based missile and space launch operations in the Pacific. . . . The FY 1966 request of $77 million is $46 million less than currently programmed for FY 1965, principally because of the planned transfer of the Point Arguello and Point Pillar facilities in California to the Air Force. . . .

The Atlantic Undersea Test Evaluation Center (AUTEC) will have three underwater test ranges sited in a deep sea canyon off the Bahamas, designed to test weapons, sonars, and acoustics systems. The $8 million request for FY 1966 is $11 million less than the current FY 1965 program. . . .

For the General Support of all other Navy R&D laboratories and test facilities, $210 million is requested for FY 1966.

Air Force.

For the Eastern Test Range, formerly known as the Atlantic Missile Range, $221 million is requested in FY 1966. . . . To meet these more demanding requirements, the funds included in the FY 1966 request will provide a capability for covering different launch azimuths, including a capability to assist the Western Test Range in tracking polar-orbiting satellites. The program will also provide for improved ship and aircraft instrumentation to facilitate the search and rescue activities associated with the manned space flight programs.

The Air Force's Western Test Range (AFWTR) consists of a complex of range instrumentation networks supporting Air Force, Navy and NASA launches from Vandenberg Air Force Base, Point Arguello and Point Mugu. The transfer of responsibility for land-based missile and space launch operations from the Navy will be completed by the end of the current fiscal year and therefore the $62 million required for FY 1966 is included in the Air Force request.

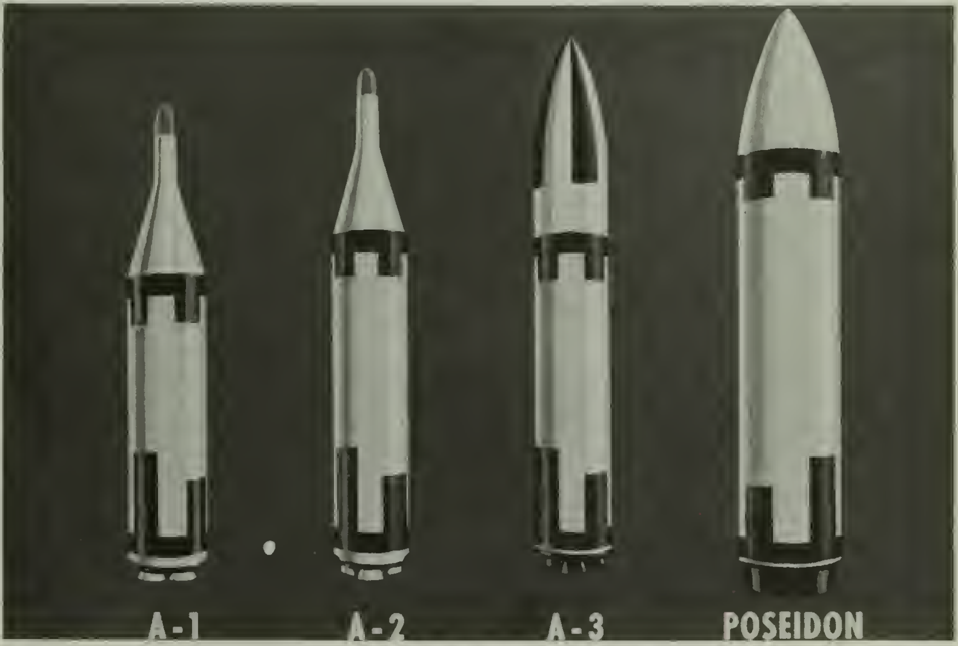
General Support, including "Development Support," will require $645 million in FY 1966. . . .

## Financial Summary

The Research and Development Program, including the development of systems approved for deployment, will require $6.7 billion in New Obligational Authority for FY 1966. A comparison with prior years is shown below:

| | 1962 Actual | 1963 Actual | 1964 Actual | 1965 Est. | 1966 Proposed |
|---|---|---|---|---|---|
| | ($ Billions, Fiscal Years) | | | | |
| R&D—except systems approved for deployment | 4.2 | 5.1 | 5.3 | 5.1 | 5.4 |
| R&D—systems approved for deployment | 2.6 | 2.5 | 2.3 | 1.9 | 1.9 |
| Total R&D | 6.8 | 7.6 | 7.6 | 7.0 | 7.3 |
| Less: Support from other appropriations | —0.5 | —0.5 | —0.5 | —0.4 | —0.5 |
| Total R&D (TOA) | 6.3 | 7.1 | 7.1 | 6.6 | 6.8 |
| Less: Financing Adjustments | —0.9 | —0.1 | —0.1 | —0.1 | —0.1 |
| Total R&D (NOA) | 5.4 | 7.0 | 7.0 | 6.5 | 6.7 |

This artist's sketch shows the comparative designs of the three versions of the Polaris missile and the proposed Poseidon missile. Poseidon is a follow-on missile to Polaris. Fleet Ballistic Missile submarines will, with minor modifications to the launching system, be able to carry the Poseidon.



# FROM THE SPEAKERS ROSTRUM

*Featured in this month's "Speakers Rostrum" are excerpts from the address by Dr. Albert C. Hall, Dep. Dir. (Space), Officer of Defense Research & Engineering, at Los Angeles on March 3 at the first of five regional Advanced Planning Briefings for Industry. Highlights of other key addresses in this series, which are sponsored jointly by DOD and the National Security Industrial Assn., will appear in subsequent issues of the* Bulletin.

Dr. Albert C. Hall

Excerpts from address by Dr. Albert C. Hall, Dep. Dir. (Space), Office of Defense Research & Engineering, before DOD-NSIA Advanced Planning Briefing Conference, Los Angeles, Calif.

## The Technological Challenge of the Next Ten Years

Our military technology is supported by a RDT&E budget for which we have requested $6.5 billion for Congressional appropriation and authorization in FY 1966.... Since the RDT&E budget is substantially affected by the force level decisions and potential decisions, we can say, with reasonable confidence, that this area of expenditure is likely to remain relatively constant for the next few years.

There are uncertainties in the budget because there are uncertainties in the operational needs, and there are uncertainties because there are technical unknowns. For example, assume for a moment that the RDT&E budget remained level at $6.5 billion over the next ten years time period which my topic covers. We would then be discussing military technology supported by a total obligation of $65 billion. . . .

Therefore, I hope it is clear that there is a relatively predictable fraction and relatively unpredictable fraction of future military technology expenditures. The predictable portion is closely related to force level decisions and improvements that we believe should be feasible to implement. The unpredictable fraction of the technology budget is related to innovations, discoveries, inventions which have not appeared. These cannot be forecasted and our policy in regard to this area in the Department of Defense is to create an atmosphere conducive to the birth of these new ideas. Indeed, unless such ideas appear it may be that a level of $6.5 billion per year should not be sustained.

Our R&D efforts today may be divided approximately into four broad functional areas—Strategic Systems, Space, Limited Warfare and Research and Exploratory Development. . . .

### Strategic Systems

Because of the tremendous outlays we have made in our strategic systems in the past, the investment must be protected and improved. Since it is in first-class condition today and we intend to keep it that way, the situation has important implications insofar as the direction of developments that will be emphasized. . . . We have been carrying a development program of large solid motors in the 120-inch and 156-inch diameter. These could be applied in the future to increasing the capability over MINUTEMAN II, which already is a substantial improvement of MINUTEMAN I. Guidance and geodesy show promise of improvement and we will push this improvement as far as technology permits. We are working to make our warheads harder to detect and counter, and much of this work is carried out under the ABRES program, which is funded

### SECDEF MESSAGE TO INDUSTRY BRIEFINGS

*While he was unable to be present in Los Angeles on March 3 for the opening of the first of the five regional Advanced Planning Briefings for Industry, Secretary of Defense Robert S. McNamara underscored their significance in the following message which was read to participants in the briefings by Joseph A. Califano, Jr., The Special Assistant to the Secretary and Deputy Secretary of Defense:*

**"The military security of the United States depends upon more than the superiority of our military strategy and tactics. Maintaining our security requires, also, that we remain ahead in the technological competition for better weapons systems—and, above all, that we excel in managing the vast resources required to develop, acquire and maintain the forces which are the foundation of our national policies.**

**"Management of our Defense resources is a job which cannot be done by Government alone. Such management can result only from efficient partnership between Government and industry. The series of meetings which you are about to attend are an expression of that partnership—and of our continuing joint effort to operate the Defense procurement program with a maximum degree of efficiency and economy, with fair and equitable profits to contractors, and in an environment which preserves the basic principles of the free enterprise system.**

**"I believe that the Advanced Planning Briefings for Industry will make an important contribution to our joint trusteeship on behalf of the American people for the expenditure of some $30 billion annually in Defense procurement—and will thereby greatly assist President Johnson in his efforts to assure our country a dollar's worth of Defense for every dollar spent."**

at more than $150 million a year. The initiation of the development of the POSEIDEN missile, announced recently by the President, illustrates the direction that will be emphasized in strategic system development. The POSEIDEN makes use of the launch and invulnerability offered by our still growing fleet of nuclear submarines but offers the possibility of substantial increases in effectiveness over POLARIS. There are many competitive opportunities available to industry with the initiation of POSEIDEN. . . .

The operation of NIKE X depends upon the development of a radar that can handle effectively the large numbers of targets (real and decoys) that might be expected in an attack, the use of the drag exerted by the atmosphere to help distinguish between real targets and decoys, and the development of an interceptor missile, the SPRINT, to reach these targets while they are still high in the atmosphere. . . . Unless the interceptor can reach the target very rapidly, the defense cannot make use of the atmosphere to help distinguish between true and false targets. However, when interceptor times have been reduced to a certain point there is little to be gained by further reductions. Improvements on the SPRINT missile are studied as part of the ARPA Hibex program.

Because of the range of threats to which we may be exposed, from large sophisticated attacks to small or accidental ones, we have adopted a "building block" philosophy in NIKE X in which, by various mixes of missiles and radars, a defense deployment can be tailored to any reasonable threat. By augmentation at selected sites or by geographical diversity, an initial capability can be raised subsequently to a higher level. . . .

Finally, there are a number of other areas in strategic systems where we are constantly looking for better development. . . . These systems are: strategic command and control, range instrumentation and support, and surveillance and detection equipment (such as BMEWS and SPASUR). These programs will be in being for as far ahead as we can see. Together, they represent a large market of about $300 million a year, particularly to the electronic industry. We are always looking for improvements here, will continue to do so for the foreseeable future, and encourage you to work with the appropriate military department with your ideas for improvements in effectiveness.

## Space Systems

Let us now consider the challenges and problems in another area of great interest to us; namely, space systems in support of national security. . . . The Department of Defense space expenditures are about $1.5 billion annually and we expect that level of effort to stay relatively constant for the foreseeable future.

In general, the basic rule used in the Defense Department with respect to space is this: if a mission can be done more effectively in space than on the earth's surface, that is where it will be done. Over and beyond that basic rule, we will support the national space program by developing technology in order to advance the state of the art, to explore the environment more thoroughly, and to provide "technological insurance" against possible surprise in space. . . .

The military missions performed in the space environment today are in the nature of support systems rather than weapons systems as such. Today we have no weapons deployed in space, and it is unlikely that we will deploy such weapons in the future. Responsible analysis to date has concluded that such systems are both less effective and more costly than comparable surface based weapons. However, we will continue to place emphasis on space for support and today we are making very effective use of unmanned satellites for all types of important supporting missions — navigation, surveillance, communication, geodesy, weather, etc. . . .

I think you can see what our major problems in the space program are from this outline: reliability and lifetime of components, cost, and useful military missions. To some extent they interact, and an improvement in one area will lead to improvements in the other. A major advance has been that our past nemesis, weight-lifting ability, has been to a large extent overcome. We believe that in space particularly, the direction we will go will be governed by the ideas you produce.

## Limited Warfare

The area of tactical weapons research and development presents a different type of technical challenge to the country. With the emplacement of our strategic missile forces substantially behind us, we expect to continue to emphasize the so-called limited war systems that, as you know, saw a large increase in effort during the past four years. . . .

Is there a guiding theme for limited war research and development? Clearly, an entire spectrum of possible conflict is involved—from Korea-type wars to counterinsurgency. Moreover, there are special aspects to the topic: naval problems, including ASW; close-air support; reconnaissance and battlefield surveillance; tactical missiles, etc. This means that research and development for limited warfare is characterized by great diversity, and generalized statements may not be meaningful. . . .

There are several problems that seem to be common to almost all tactical situations. . . . The most important of these common problems, I think, is target acquisition. Whether we are talking about antitank operations, or antisubmarine operations, or locating and destroying enemy troop units, the problem of "where is the target and how deployed" looms up. For instance, the location and identification of hostile submarines remains, and is likely to continue to remain the number one priority in the ASW field even though great effort has been given the question since World War II. Progress here may require improved understanding of the underseas environment by all responsible for development of detection equipment. It may be particularly important to develop long life, reliable, deep operating, remote sensors and weapons. It may be that the ocean is so big that the problem cannot be handled any other way. . . .

Another point that bears emphasis is that the nature of the target can change in the future and we are led to search for entirely different methods for target detection and acquisition. There is much opportunity for creative ideas here.

There are related problems in shipborne radar. Today the size of detection and acquisition equipments aboard ship required for the multiple targets a ship must handle is such that we cannot put aboard all the armament we would like. . . . A similar situation exists in the surface-search installation. As target handling requirements grow, this situation becomes even more severe. There is a real challenge to industry in the needs we foresee here.

Our tactical aircraft can make use of improved capability in the target acquisition area. We hope industry can develop an effective airborne track-while-scan radar that can be used for land surveillance as well as air targets. . . .

The second problem listed as typical of tactical situations is self-location. There is the need of self-location of mobile ground forces in relative coordinates with very small errors. This is important for re-supply, fire direction and command. How well a mobile unit can locate itself is critical—and time is of the essence. . . . Allied to this is the need for better identification of friendly forces, particularly by aircraft. . . . This problem is shared by naval forces and I will refer to it again later.

The third general problem listed was that of coping with the environment. This, of course, includes a wide variety of problems but let me illustrate by one problem, that is over-land mobility. The all-terrain, all-weather vehicle is the dream of every military man that ever lived and we are still looking. . . .

Other problems in tactical naval warfare illustrate the importance of cost to limited warfare. Consider the problems associated with nuclear propulsion for naval vessels other than carriers. As the costs of nuclear propulsion become lower, the idea of broader application of nuclear propulsion becomes more attractive. Today costs are approaching the point where nuclear propulsion on very large ships is almost competitive with oil. However, carriers cannot operate well by themselves and it is highly desirable to provide comparable speed and endurance to the requiring supporting forces. Substantially lower costs may have a dramatic influence on task force effectiveness . . .

Let me close this section on tactical, limited war needs by listing a few of the problems we want to solve today.

We need longer mean-time between failure in equipment in the operational environment. Mean-time between failure tests in the laboratory or special flight test is giving optimistic results. Also, much of our avionic equipment does not include the self-check features that are feasible now.

We need better work to match advanced conventional ordnance against its targets.

Low level attack in aircraft tactics we believe important. We need better control and instrumentation techniques to support this tactic.

Our aircraft use rocket ordnance extensively. We are not getting the life before use with this ordnance we should. Solid propellants for this and other applications may become unreliable just sitting on the shelf.

Counterinsurgency experience has highlighted specific problems. Here are a few. We need better ways to find guerrillas and their supplies; specifically: (a) people detection from air or on the ground, especially under foliage or in caves; (b) cache detection; (c) underground tunnel detection; and (d) contraband detection on motorized or steel boats. These must employ technology which, while it may be sophisticated, is cheap, simple, and easily maintained in use.

We need better power supplies for communication. We won't be satisfied until we have equipment that has infinite life, zero weight and never requires maintenance.

Progress has been made in image intensification for night viewing. We would like goggles with one thousand yard range on a dark night, wide field of view, no weight, no trouble.

I hope that you will agree from this list that we have not yet run out of challenging opportunities for our best technical people.

## Research and Exploratory Development

The final area . . . is that of Research, or perhaps more accurately, the technical area supported by the Research and Exploratory Development budget categories. . . . It is from this area that we seek the ideas that will eventually form the foundation of our future military systems. It is also to this area that we look to avoid technological surprises. I wish we could say where to concentrate your efforts in order to turn up ideas that would lead to developments as significant as the thermonuclear device or the jet engine. Clearly, I can't and it would be a disservice to try. The best we can do is to support sound creative people, set an atmosphere stimulating to meeting defense applications with innovation, and guarantee an audience at any level to the individual with a revolutionary idea.

Finally let me close by restating how misleading it may be to predict trends in the future by generalizations on the experiences of the past. We emphasize reliability and one way of achieving it is through simplification. This is, of course, desirable, but in electronics we see two developments flowering rapidly that can completely change our concept of what may be feasible in automatic systems. The first of these is the technology of integrated circuits. The second of these developments is the machine assembly of electronic modules into complete systems. . . .

But as so often is the case, a step forward in one direction uncovers a bottleneck in another. As the complexity of our electronic systems increases, we find that our methods of directing (or programming) these complex systems are creaking from overload. Programs (software in trade parlance) are so complex that it may require years to discover that subtle errors remain in them. The development of these programs requires such an investment that industry copyrights them.

We should like to devise methods of proving that a certain computer program actually performs some specified function. Such a method would eliminate costly and time-consuming "debugging." In order to be able to prove that a program works correctly, we need both a mathematical theory and automatic checking systems which use the theory. We may be reaching the point where we need to develop a general problem solver able to solve the problem of how to improve itself. General problem solvers today are able only to prove simple mathematical theorems, play simple games, and do other trivial work. A general problem solver of the kind mentioned here would reach the "critical mass" of automatic problem solving, and would open up entirely new technological possibilities. As a matter of fact, if it were good enough, it might even advise us how to spend our RDT&E funds.

# SPEAKERS CALENDAR

## OFFICE OF THE SECRETARY OF DEFENSE

**Hon. John T. McNaughton**, Asst. Secretary of Defense (International Security Affairs), at Atlantic Community Roundtable, Brookings Institution, Washington, D. C., March 25.

**Hon. Paul R. Ignatius**, Asst. Secretary of Defense (Installations & Logistics), at NSIA Briefing, Chicago, Ill., March 31.

**VAdm. J. M. Lyle**, Dir., Defense Supply Agency, at NSIA Briefing, Chicago, Ill., March 31.

**Mr. Paul H. Riley**, Dep. Asst. Secretary of Defense (Supply & Services), at NSIA Briefing, Chicago, Ill., March 31.

**Hon. Charles J. Hitch**, Asst. Secretary of Defense (Comptroller), at University of California, Berkeley, Calif., April 5-9.

**Maj. Gen. J. B. Bestic**, Dep. Dir. for National Military Command System, Defense Communication Agency, at National Aerospace Electronics Conference, Dayton, Ohio, May 11.

## ARMY

**Lt. Gen. Walter K. Wilson, Jr.**, Chief of Engineers, U. S. Army, at American Society of Civil Engineers, Washington, D. C., March 23.

**Brig. Gen. Ellis E. Wilhoyt, Jr.**, Asst. to the Chief of Engineers for NASA Suport, at Society of American Military Engineers, San Francisco, Calif., March 26.

**Gen. Harold K. Johnson**, Chief of Staff, U. S. Army, at Calvin Bullock Forum, New York, N. Y., March 30.

**Lt. Gen. William W. Dick, Jr.**, Chief of Research & Development, U. S. Army, at U. S. Army Operations Research Symposium, Huntsville, Ala., March 30.

**Brig. Gen. Walter E. Lotz, Jr.**, Dir. of Army Research, at U. S. Army Operations Research Symposium banquet, Huntsville, Ala., March 31.

**Hon. Daniel M. Luevano**, Asst. Secretary of the Army (Installations & Logistics), at NSIA Briefing, Chicago, Ill., April 1.

**Maj. Gen. J. W. Sutherland, Jr.**, Commanding General, U. S. Army Test & Evaluation Command, at American Ordnance Assn. Meeting, Aberdeen Proving Ground, Md., May 17.

## NAVY

**Adm. D. L. McDonald**, Chief of Naval Operations, at National Rifle Assn. Meeting, Washington, D. C., March 31.

**Lt. Gen. L. F. Chapman, Jr.**, Chief of Staff, U. S. Marine Corps, at Marine Corps luncheon of the Annual Convention, Navy League of the United States, Washington, D. C., April 21.

**Lt. Gen. J. P. Berkeley**, Commanding General, Fleet Marine Forces, Atlantic, at the American Society of Naval Engineers, Washington, D. C., April 30.

## AIR FORCE

**Maj. Gen. D. R. Ostrander**, Commander, Office of Aerospace Research, at 2nd Space Congress, Cocoa Beach, Fla., April 5.

**Hon. A. H. Flax**, Asst. Secretary of the Air Force (Research & Development), at American Institute of Aeronautics & Astronautics meeting, Palm Springs, Calif., April 6; at Notre Dame University, South Bend, Ind., April 14; at University of New York, Buffalo, N. Y., May 5.

**Maj. Gen. R. L. Bohannon**, The Surgeon General, USAF, at Industrial Medical Assn., Miami Beach, Fla., April 7.

**Gen. B. A. Schriever**, Commander, Air Force Systems Command, USAF, at General Dynamics/Astronautics Management Club, San Diego, Calif., April 15.

**Maj. Gen. R. H. Curtin**, Dir. of Civil Engineering, Hq. USAF, at Society of American Military Engineers Meeting, Chicago, Ill., April 20.

**Lt. Gen. James Ferguson**, Dep. Chief of Staff (Research & Development); **Maj. Gen. R. L. Bohannon**, The Surgeon General, USAF; and **Brig. Gen. J. S. Bleymaier**, Dep. Commander, Space Systems Div. for Manned Systems, AFSC, at Aerospace Medical Assn. meeting, New York, N. Y., April 26.

**Maj. Gen. W. S. Steele**, USAF, Dep. Commandant, Industrial College of the Armed Forces, keynote address at the National Security Seminar, Portland, Ore., April 26.

**Hon. Leonard Marks, Jr.**, Asst. Secretary of the Air Force (Financial Management), at Society for Advanced Management Meeting, Los Angeles, Calif., May 12.

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## DOD Briefings Include Procurement Counseling

The remaining three unclassified Advanced Planning Briefings, jointly sponsored by DOD and the National Security Industrial Association, will be held in Chicago, March 31-April 1, Dallas, April 14-15, and Washington, D. C., April 28-29.

Supplementing the briefings, the DOD, joined by the Department of Commerce, the Small Business Administration, and major prime contractors, is offering procurement counseling to scientific and industrial community representatives in attendance This counseling service is offered for those interested on a scheduled basis in an area adjacent to the main briefings during the initial two days of the briefings. Arrangements have also been made for the procurement specialists and counselors to stay a third day if sufficient interest warrants. The procurement counseling is the sole activity on the third day.

The counselors from the Army, Navy, Air Force, and the Defense Supply Agency are present to discuss and explain the Defense procedures for source development and utilization; prime and subcontract opportunities (including a discussion of areas of shortages in competitive sources); the preference programs for set-asides for small business and labor surplus areas; the clause for subcontracting; and like data. All these are discussed in terms of current Army, Navy, Air Force, and DSA Invitations for Bids and Requests for Proposals.

# MEETINGS AND SYMPOSIA

## April 1965

**Support of Manned Flight Conference**, April 21-23, at Biltmore Hotel & Engineer's Club, Dayton, Ohio. Sponsors: Air Force Systems Command & Aeronautical & Aerospace Industries Assn. Contact: Ray Parker (SEPIE), Air Force Systems Command, Wright-Patterson AFB, Ohio, telephone: 253-7111, Ext. 26119.

## May 1965

**Navy Underwater Research Program** Conference, May 4, at Boca Raton, Fla. Sponsor: Industrial Research Institute of Durham, N. C. Navy Coordinator: Public Information Div., Office of Naval Material, Washington, D. C.

Conference on **Ultrapurification of Solid-State Electronics Materials**, May 6-8, at Waldorf-Astoria Hotel, New York, N. Y. Sponsors: Air Force Cambridge Research Laboratories and New York Academy of Sciences. Contact: Dr. A. F. Armington, Air Force Cambridge Research Laboratories (CRW), L. G. Hanscom Field, Bedford, Mass., telephone Area Code 617, CR 4-6100, Ext. 4086.

Second Aerospace **Expandable Structures** Conference, May 25-27, at Lafayette Club, Minneapolis, Minn. Sponsors: Air Force Propulsion Laboratory & Archer-Daniels Midland Co. Contract: Fred Forbes (APF), Air Force Propulsion Laboratory, Wright-Patterson AFB, Ohio, telephone: 253-7111, Ext. 25167.

**Aerospace & Hydrospace Technical Symposium**, May 25-28, at San Francisco, Calif. Sponsor: Northern Calif. Chapter of Society of Aerospace Material & Process Engineers. Navy Coordinator: Commanding Officer, Mare Island Naval Shipyard, and Public Information Div., Office of Naval Material, Washington, D. C.

## June 1965

Conference on **Environment Sensitive Mechanical Behavior of Materials**, June 7-8, at Research Institute for Advanced Studies (Martin Co.), Baltimore Md. Sponsors: U. S. Army Research Office, Durham, N.C.; Research Institute for Advanced Studies (Martin Co.); and Physical Metallurgy Committee, American Institute of Mining Metallurgical, and Petroleum Engineers, Inc. Contact: Dr. A. R. C. Westwood for scientific matters; Mr. J. S. Fly for administrative matters; both at Research Institute for Advanced Studies (Martin Co.), 7212 Bellona Ave., Baltimore, Md., telephone 435-1100.

Symposium on **Modern Mathematical Physics**, June 7-9, at New York, N. Y. Sponsors: Air Force Office of Scientific Research & Society for Industrial & Applied Mathematics. Contact: Capt. J. Jones, Jr., (SRMA), Air Force Office of Scientific Research, Washington, D. C. 20333, telephone: OXford 6-1302.

International Symposium on **Multivariate Analysis**, June 14-19, at Dayton, Ohio. Sponsor: Aerospace Research Laboratories. Contact: Dr. P. R. Krishnaiah, Aerospace Research Laboratories (ARM), Wright-Patterson AFB, Ohio, telephone 253-7111, Ext. 36211.

Tenth Anniversary AFOSR Scientific Seminar **Science In The Sixties**, June 14-25, at Cloudcroft, N. M. Sponsor: Air Force Office of Scientific Research. Contact: Mr. David L. Arm, Air Force Office of Scientific Research (SRGL), Washington, D. C. Attendance by DOD personnel. Others by invitation.

Fifth Berkeley Symposium on **Mathematical Statistics & Probability**, June 21-July 18, at University of California, Berkeley, Calif. Sponsors: Air Force Office of Scientific Research, Army Research Office, Office of Naval Research, National Institutes of Health, National Science Foundation, and University of California. Contact: Dr. R. G. Pohrer, (SRMM), Air Force Office of Scientific Research, Washington, D. C. 20333, telephone: OXford 6-5248.

Symposium of **Fluid Mechanics & Heat Transfer Under Low-Gravity Conditions**, June 24-25, at Lockheed Missiles & Space Co., Sunnyvale, Calif. Sponsors: Air Force Office of Scientific Research & Lockheed Missiles & Space Co. Contact: Capt. L. P. Gregg, (SREM), Air Force Office of Scientific Research, Washington, D. C. 20333, telephone: OXford 6-3425.

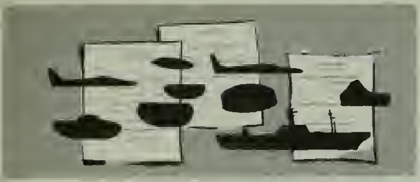
Seminar on **Relativity Theory & Astrophysics**, June 24-July 22, at Cornell University, Ithaca, N. Y. Sponsors: Air Force Office of Scientific Research, Army Research Office, Atomic Energy Commission, National Science Foundation, and National Aeronautics & Space Administration. Contact: Maj. B. R. Agins, (SRMA), Air Force Office of Scientific Research, Washington, D. C. 20333, telephone: OXford 6-1302.

**Relaxation Techniques in Chemical Kinetics**, June 28-30, at State University of New York, Buffalo, N. Y. Sponsors: Air Force Office of Scientific Research, American Chemical Society and State University of New York. Contact: Dr. Ralph G. Wilkins, Department of Chemistry, State University of New York, Buffalo, N. Y., telephone Area Code 716, 831-3905.

Conference on **Small-Angle X-Ray Scattering**, June 24-27, at Sagamore Conference Center, Syracuse University, Raquette Lake, N. Y. Sponsors: Department of the Army, Syracuse University Research Institute. Contact: Maj. Lawrence P. Monahan, Jr., U. S. Army Research Office, Durham, Box CM, Duke Station, Durham, N. C. 27706, telephone, Area Code 919, 286–2285.

Second **Interdisciplinary Conference on Electromagnetic Scattering** (ICES–II), June 28-30, at Amherst, Mass. Sponsor: Air Force Cambridge Research Laboratory, L. C. Hanscom Field, Bedford, Mass., telephone, Area Code 617, CR 4-6100, Ext. 3633.

**All meetings listed are Unclassified.**



# DEFENSE PROCUREMENT

**Contracts of $1,000,000 and over awarded during month of February 1965:**

## DEFENSE SUPPLY AGENCY

11—**J. P. Stevens & Co., Inc.**, New York, N. Y. $1,369,200. 600,000 yards of tropical wool cloth. Rockingham, N. C. and Wallace and Greer, S. C. Defense Clothing & Textile Supply Center, Philadelphia, Pa.

—**Pacific Mills, a div. of Burlington Industries, Inc.**, Halifax, Va. $1,377,000. 600,000 yards of tropical wool cloth. Raeford, N. C. and Clarksville, Va. Defense Clothing & Textile Supply Center, Philadelphia, Pa.

19—**Eastman Kodak Co.**, Rochester, N. Y. $1,555,700. 9,400 rolls of aerial film. Rochester. Defense General Supply Center, Richmond, Va.

—**Royal Lubricants Co., Inc.**, Hanover, N. J. $1,006,710. 1,459,000 quarts of aircraft engine oil. Defense Fuel Supply Center, Washington, D. C.

23—**Socony Mobil Oil Co.**, New York, N. Y. $2,027,035. 1,000,000 barrels of fuel oil and 41,840 barrels of diesel fuel. Defense Fuel Supply Center, Washington, D. C.

—**Texaco, Inc.**, New York, N. Y. $1,722,750. 850,000 barrels of fuel oil. Defense Fuel Supply Center, Washington, D. C.

24—**Humble Oil & Refining Co.**, Houston, Tex. $4,455,400. 53,000,000 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Socony Mobil Oil Co., Inc.**, New York, N. Y. $3,419,480. 39,249,000 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Sun Oil Co.**, Philadelphia, Pa. $3,278,016. 36,620,000 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Union Oil Co. of California**, Los Angeles, Calif. $2,221,177. 21,905,100 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Coastal States Petrochemical Co.**, Corpus Christi, Tex. $1,890,655. 22,680,000 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Edgington Oil Refineries, Inc.**, Long Beach, Calif. $1,069,729. 10,500,000 gallons of JP–5 jet fuel. Defense Fuel Supply Center, Washington, D. .C

25—**Debco Corp., Div. of Premier Oil Refining Co. of Texas**, Abilene, Tex. $5,846,079. 61,682,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Debco Corp., Div. of Premier Oil Refining Co. of Texas**, Abilene, Tex. $1,141,275. 11,780,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Shamrock Oil & Gas Corp.**, Amarillo, Tex. $3,739,511. 38,186,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Shamrock Oil & Gas Corp.**, Amarillo, Tex. $1,925,500. 20,000,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Golden Eagle Refining Co., Inc.**, Los Angeles, Calif. $3,003,834. 31,260,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**MacMillan Ring-Free Oil Co.**, Los Angeles, Calif. $2,890,562. 29,285,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Coastal States Petrochemical Co.**, Corpus Christi, Tex. $2,868,535. 30,560,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Bell Oil & Gas Co.**, Tulsa, Okla. $2,800,409. 34,650,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Delta Refining Co.**, Memphis, Tenn. $2,383,921. 25,085,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Sioux Oil Co.**, Newcastle, Wyo. $1,884,800. 16,000,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Leonard Refineries, Inc.**, Alma, Mich. $1,877,982. 19,735,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Howell Refining Co.**, San Antonio, Tex. $1,656,539. 17,478,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Crystal Flash Petroleum Corp.**, Indianapolis, Ind. $1,322,315. 12,350,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Northwestern Refining Co.**, St. Paul Park, Minn. $1,297,773. 14,367,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Cardinal Transports, Inc.**, San Antonio, Tex. $1,079,062. 11,625,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

—**Tesoro Petroleum Corp.**, San Antonio, Tex. $1,046,608. 9,800,000 gallons of JP–4 jet fuel. Defense Fuel Supply Center, Washington, D. C.

## ARMY

2—**Atlantic Gulf & Pacific Co.**, New York, N. Y. $2,258,296. Dredging work on the Houston Ship Channel Project. Harris County, Tex. U. S. Army Engineer Dist., Galveston, Tex.

5—**Bell Helicopter Co., div. of Bell Aerospace Corp.** Fort Worth, Tex. $3,469,510. UH–1E helicopters. Fort Worth. U. S. Army Aviation Command (AMC), St. Louis, Mo.

—**Reed & Martin International, Inc.**, Honolulu, Hawaii. $2,069,538. Construction of 100 4-bedroom family housing units. Schofield Barracks, Hawaii. U. S. Army Engineer Dist., Honolulu, Hawaii.

—**Scovill Mfg. Co.**, Waterbury, Conn. $2,257,685. Metal parts for bombs. Waterbury. Procurement Dist. (AMC), Boston, Mass.

8—**Chaney & James Construction Co., Inc.**, Richardson, Tex. $4,353,000. Construction of a vehicle service and vertical checkout building and a barge service building at the NASA Test Facility, Hancock County, Miss. Dist. Corps of Engineers, Mobile, Ala.

—**Bauer Dredging Co., Inc.**, Port Lavaca, Tex. $1,129,279. Dredging work on the Matagorda Ship Channel Project. Corpus Christi, Tex. U. S. Army Engineer Dist., Galveston, Tex.

9—**Jahncke Service, Inc.**, New Orleans, La. $1,436,600. Construction work on the Atchafalaya Basin Floodway Project. Napoleonville, La. U. S. Army Engineer Dist., New Orleans, La.

—**Sylvania Electronics Systems, Sylvania Electric Products, Inc.**, Needham Heights, Mass. $7,500,000. Classified electronic equipment. Needham Heights. Electronics Command (AMC), Ft. Monmouth, N. J.

—**Oakland Construction Co.**, Salt Lake City, Utah. $1,294,800. Construction of a MINUTEMAN engineering test facility. Hill AFB, Ogden, Utah. Sacramento Dist. Corps of Engineers, Sacramento, Calif.

10—**Global Associates**, Oakland, Calif. $17,334,517. Support services at the Kwajalein Test Site, Pacific. Redstone Arsenal (AMC), Huntsville, Ala.

Contract Index

Contract information is listed in the following sequence: Date—Company—Dollar Value—Material—Location of Work Performed—Contracting Agency

—**Atlas Construction Co., Inc.**, Ruston, La. $2,018,240. Construction work on the Mississippi River and Tributaries Channel Improvement Project. St. Francisville, La. Dist. Corps of Engineers, New Orleans, La.

11—**Great Lakes Dredge & Dock Co.**, Chicago, Ill. $4,289,900. Dredging work on the Calumet River Navigation Project. Chicago Dist. Corps of Engineers, Chicago, Ill.

12—**Bauer Dredging Co., Inc.**, Port Lavaca, Tex. $1,040,711. Work on the Arkansas River and Tributaries Project. Grady, Ark. Dist. Corps of Engineers, Little Rock, Ark.

15—**Warrior Constructors, Inc.**, Houston, Tex. $3,224,815. Construction of a project engineering facility at the NASA Manned Spacecraft Center. Houston, Tex. Dist. Corps of Engineers, Fort Worth, Tex.

16—**Jahncke Service, Inc.**, New Orleans, La. $1,691,740. Dredging work on the Galveston Harbor and Channel, Texas, Project. Galveston, Tex. U. S. Army Engineer Dist., Galveston, Tex.

—**Hesse Eastern Div., Norris Thermador Corp.**, Everett, Mass. $1,735,696. 105-millimeter projectiles. Brockton, Mass. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

17—**Alonzo Cothron, Inc.**, Islamorado, Fla. $1,096,310. Construction and excavation work on the Central and Southern Florida Flood Control Project. Osceola County, Fla. Dist. Corps of Engineers, Jacksonville, Fla.

—**Standard Dredging Corp.**, New Orleans, La. $3,119,942. Work on the Mississippi River and Tributaries Channel Improvement (dredging) Project. Memphis, Tenn. Dist. Corps of Engineers, Memphis, Tenn.

—**Bell Aerosystems Co. div. of Bell Aerospace Corp.**, Tucson, Ariz. $17,903,185. Services for the operation, maintenance, future development, and modernization of the Electro-Magnetic Environmental Field Test Facility. Ft. Huachuca, Yuma Proving Ground, and Gila Bend, Ariz., and other related test sites. Electronic Proving Ground (AMC), Ft. Huachuca, Ariz.

—**Beech Aircraft Corp.**, Wichita, Kan. $2,582,250. Fixed-wing airplane trainers. Wichita. Aviation Command (AMC), St. Louis, Mo.

18—**Martin K. Eby Construction Co., Inc.**, Wichita, Kan. $18,498,571. Construction work at Lock and Dam No. 5, Arkansas River Navigation Project. Pine Bluff, Ark. U. S. Engineer Dist., Little Rock, Ark.

—**Johnson Machine Works, Inc.**, Chariton, Iowa. $1,438,630. Installation work on the Arkansas River Navigation Project. Pine Bluff, Ark. U. S. Army Engineer Dist., Little Rock, Ark.

—**Butler Mfg. Co.**, Minneapolis, Minn. $1,257,564. 101 four-wheel semi-trailer tanks. Minneapolis. Chicago Procurement Dist. (AMC), Chicago, Ill.

—**Frazier Davis Construction Co. and Gamco, Inc.**, St. Louis, Mo. $3,247,534. Construction work on the Missouri Flood Protection Project. St. Louis. Dist. Corps of Engineers, St. Louis, Mo.

—**Construction Aggregates Corp.**, Chicago, Ill. $3,075,000. Dredging work on a section of the Chesapeake and Delaware Canal Project. Summit Bridge, Del. Dist. Corps of Engineers, Philadelphia, Pa.

—**Cone Brothers Contracting Co.**, Tampa, Fla. $1,233,605. Construction work on the Cross Florida Barge Canal Project. Inglis, Fla. Dist. Corps of Engineers, Jacksonville, Fla.

19—**Chamberlain Corp.**, Scranton, Pa. $3,518,719. 8-inch projectiles. Scranton Army Ammunition Plant. U. S. Army Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**E&I, Inc.**, Fort Lauderdale, Fla. $2,456,218. Construction and excavation work on the Central and Southern Florida Flood Control Project. Broward, Hendry, and Collier counties in Fla. Dist. Corps of Engineers, Jacksonville, Fla.

—**James & Hardy**, Montevallo, Ala. $1,460,877. Construction of three classroom buildings. Ft. Rucker, Ala. Dist. Corps of Engineers, Mobile, Ala.

—**General Motors Corp.**, Cleveland, Ohio. $1,085,000. Vehicle engineering services for the M109 self-propelled howitzer, with 155mm gun. Cleveland. Procurement Dist. (AMC), Cleveland, Ohio.

—**General Dynamics/Pomona div. of General Dynamics Corp.**, Pomona, Calif. $3,552,518. Continuation and completion of the Feasibility Validation Program of the MAULER weapon system. Pomona. Los Angeles Procurement Dist. (AMC), Pasadena, Calif.

23—**Honeywell, Inc.**, Hopkins, Minn. $1,076,683. Ammunition and special tooling. Twin Cities Army Ammunition Plant, New Brighton, Minn. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

24—**Algernon Blair, Inc.**, Montgomery, Ala. $8,710,800. Construction of 10 EM barracks with support facilities. Ft. Gordon, Ga. Engineer Dist., Savannah, Ga.

25—**Codell Construction Co.**, Winchester, Ky.; **Oman Construction Co.**, Nashville, Tenn.; and **Hardaway Contracting Co.**, Columbus, Ga. $9,898,561. Construction and excavation work on the Fishtrap Reservoir Project in Kentucky. Pikeville, Ky. Dist. Corps of Engineers, Huntington, W. Va.

—**Whittenberg Engineering & Construction Co., Inc.**, Louisville, Ky. $4,474,356. Construction of troop housing and supporting facilities. Ft. Knox, Ky. U. S. Army Engineer Dist., Louisville, Ky.

—**Hensel Phelps Construction Co.**, Greeley, Colo. $10,464,495. Construction of an EM barracks complex and support facilities. Ft. Carson, Colo. Engineer Dist., Omaha, Neb.

26—**General Motors Corp.**, Detroit, Mich. $2,879,992. For 8-cylinder diesel engines for combat vehicles. Detroit Army Tank Automotive Center (AMC), Warren, Mich.

—**Admiral Corp.**, Chicago, Ill. $1,837,008. Radar surveillance sets and ancillary items. Chicago. U. S. Army Electronics Command (AMC), Ft. Monmouth, N. J.

—**Universal Constructors**, Albuquerque, N. M. $1,852,700. Construction and excavation work on the Albuquerque Div. Channel, Phase I Project. U. S. Army Engineer Dist., Albuquerque, N. M.

—**Appalachian Power Co., Inc.**, New York, N. Y. $1,100,000. Electrical power at Radford Army Ammunition Plant, Radford, Va. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**Holston Defense Corp.**, Kingsport, Tenn. $7,663,284. Miscellaneous propellants. Holston Army Ammunition Plant, Kingsport. Ammunition Procurement & Supply Agency (AMC), Joliet, Ill.

—**University of Illinois**, Urbana, Ill. $1,200,000. Continuation of an experimental and research program in applied and electronic sciences. Urbana. Electronics Command (AMC), Ft. Monmouth, N. J.

## NAVY

1—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $26,601,966. Research and development on the POLARIS missile re-entry system. Sunnyvale. Special Projects Office.

—**Ling-Temco-Vought, Inc., LTV Vought Aeronautics Div.**, Dallas, Tex. $5,028,500. A–7A aircraft. Dallas. Bureau of Naval Weapons.

2—**Texas Instruments, Inc.**, Dallas Tex. $7,917,670. SHRIKE missile guidance and associated equipment. Dallas. Bureau of Naval Weapons.

—**Hayes International Corp.**, Birmingham, Ala. $1,142,097. Tow targets for use in air-to-air missile firing training operations. Birmingham. U.S. Navy Purchasing Office, Washington, D.C.

—**Hughes Aircraft Co.**, Fullerton, Calif. $7,729,119. Radar planar antennas and pedestals together with associated equipment for installation aboard naval ships. Fullerton. Bureau of Ships.

—**Federal Electronic Corp.**, Paramus, N.J. $11,836,491. Operational maintenance of government instrumentation systems and associated range facilities on the Western Test Range, (formerly Pacific Missile Range). U.S. Navy Purchasing Office, Los Angeles, Calif.

—**General Electric Co.**, Defense **Electronics** Div., Utica, N.Y. $2,157,095. Spare parts to support the AN/APS–96 radar sets used on the E2A special electronics installation aircraft. Utica. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

3—**Douglas Aircraft Co., Inc.**, Long Beach, Calif. $1,360,000. TA–4E jet trainer aircraft. Long Beach. Bureau of Naval Weapons.

—**Miller Davis Co.**, Melrose Park, Ill. $8,078,000. Construction of four service school barracks and four recruit barracks at the Naval Training Center, Great Lakes, Ill. Dist. Public Works Officer, 9th Naval Dist., Bureau of Yards & Docks.

4—**Franchi Construction Co.**, Newton, Mass. $3,023,000. Construction of 200 family housing units at the Naval Air Station, Quonset Point, R.I. Dist. Public Works Officer, 1st Naval Dist., Bureau of Yards & Docks.

—**Litton Systems, Inc., Guidance & Control Div.**, Beverly Hills, Calif. $2,206,688. Spare parts of the AN/ASN–56 computer systems used on the RF–4B reconnaissance aircraft. Beverly Hills. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

—**Maxson Electronics Corp.**, Old Forge, Pa. $5,961,499. BULLPUP missile guidance, control, airframes and associated equipment. Old Forge. Bureau of Naval Weapons.

—**F.D. Rich Co., Inc.**, Stamford, Conn. $1,582,268. Construction of 100 family housing units at the Naval Ammunition Depot, Charleston, S.C. Dir., Southeast Div., Bureau of Yards & Docks.

—**F.D. Rich Co., Inc.**, Stamford, Conn. $4,562,000. Construction of 302 family housing units at the Naval Station, Long Beach, Calif. Dir., Southwest Div., Bureau of Yards & Docks.

5—**Interstate Electronics Corp.**, Anaheim, Calif. $1,186,800. POLARIS test instrumentation equipment. Anaheim. Special Projects Office.

—**Bendix Corp.**, Eclipse Pioneer Div., Teterboro, N.J. $1,190,765. Spare parts for use on automatic flight control system of the T–A4E trainer aircraft. Teterboro. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

—**Raytheon Co.**, Lexington, Mass. $2,506,348. Engineering services and flight testing in connection with the SPARROW III missile program. Flight testing will be done at Oxnard, Calif., and the remainder of the work performed at Bedford, Mass. Bureau of Naval Weapons.

—**Del E. Webb Corp.**, Phoenix, Ariz. $6,424,000. Construction of 350 family housing units at Naval installations at Oahu, Hawaii. Dist. Public Works Officer, 14th Naval Dist., Bureau of Yards & Docks.

8—**Teletype Corp.**, Skokie, Ill. $1,366,749. Spare parts to support automatic teleprinter sets used in the Navy communications system. Skokie. U.S. Navy Purchasing Office, Washington, D.C.

10—**Johns Hopkins University, Applied Physics Lab.**, Silver Spring, Md. $10,257,755. Research and development effort on missile programs. Silver Spring. Bureau of Naval Weapons.

—**Bendix Corp., Eclipse Pioneer Div.**, Teterboro, N.J. $1,025,000. Components of the navigation system for the A–4E and EA–3B attack aircraft and C–130G cargo aircraft. Teterboro. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

—**Litton Systems, Inc.**, Canoga Park, Calif. $1,161,376. Studies on the Marine Corps Tactical Data System. Canoga Park. Bureau of Ships.

11—**Peterson Builders, Inc.**, Sturgeon Bay, Wis. $2,993,980. Construction of two wooden coastal minesweepers, MSC–314 and 315. Sturgeon Bay. Bureau of Ships.

12—**R.M. Wells Co., Inc.**, Quanah, Tex. $1,144,000. Conversion, rehabilitation, and improvement of Wherry Housing at the Naval Air Station, Corpus Christi, Tex. Dist. Public Works Officer, 8th Naval Dist., Bureau of Yards & Docks.

—**International Harvester Co.**, Solar Div., San Diego, Calif. $1,542,230. Auxiliary power plants for Navy helicopters. San Diego. Bureau of Naval Weapons.

15—Fred **Loffredo**, Lafayette Hill, Pa. $2,550,000. Expansion of an inertial guidance maintenance facility for USAF at Newark Air Force Station, Ohio. Dist. Public Works Officer, 4th Naval Dist., Bureau of Yards & Docks.

—**Raytheon Co.**, Lexington, Mass. $1,251,406. Modification kits for TARTAR missile control radar sets. Wayland, Mass. Bureau of Naval Weapons.

—**Simplex Wire & Cable Co.**, Newington, N.H. $5,060,423. 150 nautical miles of submarine cable. Newington. U.S. Navy Purchasing Office, Washington, D.C.

—**Yardney Electric Corp.**, New York, N.Y. $1,157,211. Batteries for use in torpedoes. Pawcatuck, Conn. U.S. Navy Purchasing Office, Washington, D.C.

—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $1,059,829. Engineering services on a submarine type inertial navigation system. Anaheim. Bureau of Ships.

—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $2,561,000. 194,408 manhours of direct labor in the conduct of a Ship Alteration Implementation Program as it pertains to Ships Inertial Navigation System developed by the firm for Fleet Ballistic Missile Submarines. Anaheim. Bureau of Ships.

16—**University of Washington, Applied Physics Lab.**, Seattle, Wash. $1,443,000. Research and development in the field of underwater ordnance. Seattle. Bureau of Naval Weapons.

17—**United Aircraft Corp., Norden Div.**, Norwalk, Conn. $2,290,866. Spare parts for radar sets used on the A–6A (INTRUDER) aircraft. Norwalk. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

—**Bendix Corp.**, Baltimore, Md. $17,805,335. Transmitter/receivers, receivers and associated equipment for installation aboard Navy ships. Baltimore. Bureau of Ships.

—**Northrop Corp., Precision Products Dept.**, Norwood, Mass. $1,083,840. 120 units of POLARIS inertial reference integrating gyroscopes. Norwood. Special Projects Office.

—**Honeywell, Inc., Aeronautical Div.**, St. Petersburg, Fla. $3,643,182. 558 units of POLARIS inertial reference integrating gyroscopes. St. Petersburg. Special Projects Office.

18—**Clevite Corp., Clevite Ordnance Div.**, Cleveland, Ohio. $1,414,097. A research and development program on backup guidance and homing control system for use with the Mk 48 torpedo. Cleveland. Bureau of Naval Weapons.

—**Norris Thermador Corp.**, Los Angeles, Calif. $2,452,275. Cartridge cases for 5-inch .38 caliber ammunition. Vernon, Calif. U.S. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**General Electric Co.**, Pittsfield, Mass. $1,165,700. Two POLARIS weapons control subsystem trainers. Pittsfield. Special Projects Office.

19—**Sperry Rand Corp., Sperry Piedmont Div.**, Charlottesville, Va. $4,466,081. Radar sets and repair parts for installation aboard naval ships. Charlottesville. Bureau of Ships.

—**Institute for Defense Analyses**, Arlington, Va. $1,982,500. Research in the field of cryptology and directly related sciences. Arlington. Office of Naval Research.

—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $1,342,000. Field engineering services on Ships Inertial Navigation Systems equipment. Shipyards throughout the United States. Bureau of Ships

—**AiResearch Mfg. Co.**, Phoenix, Ariz. $1,451,113. Modification kits designed to convert ground power units for A–5 attack aircraft and F–4 fighter aircraft. Phoenix. U.S. Navy Aviation Supply Office, Philadelphia, Pa.

23—**Sperry Rand Corp., Ford Instrument Div.**, Long Island City, N.Y. $1,150,000. Engineering services for modification kits for TERRIER and TARTAR missile computers and ancillary equipment. Long Island City. Bureau of Naval Weapons.

24—**Aerojet—General Corp.**, Azusa, Calif. $2,793,380 Engineering services and materials for the Mk 46 torpedo. Azusa. Bureau of Naval Weapons.

—**United Aircraft Corp., Hamilton Standard Div.**, Windsor Locks, Conn. $6,802,416. Propeller systems for P–3A ORION and S–2E TRACKER aircraft. Windsor Locks. Bureau of Naval Weapons.

—**Sperry Gyroscope Co.**, Syosset, Long Island, N.Y. $2,256,407. Various components of Ships Inertial Navigation System equipment on board Fleet Ballistic Missile Submarines. Syosset. Bureau of Naval Weapons.

25—**ITT Gilfillan Inc.**, Los Angeles, Calif. $14,618,227. Eight shipboard radar sets and related equipment and services. Los Angeles. Bureau of Ships.

26—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $158,603,892. POLARIS A–3 missiles. Sunnyvale and Sacramento, Calif., and Baccus, Utah. Special Projects Office.

—**Douglas Aircraft Co., Aircraft Div.**, Long Beach, Calif. $27,419,079. TA–4E aircraft (trainer version of A–4E SKYHAWK). Long Beach. Bureau of Naval Weapons.

—**Ralph Englestad Construction Co., Inc.**, Las Vegas, Nev. $1,132,153. Construction of 74 family housing units at the Marine Corps Supply Center, Barstow, Calif. Dir., Southwest Div., Bureau of Yards & Docks.

## AIR FORCE

1—**Bendix Corp., Bendix Products Aerospace Div.**, South Bend, Ind. $1,589,048. Spare parts for F–101 aircraft. South Bend. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

2—**Astronautics Corp. of America**, Milwaukee, Wis. $2,762,050. Flight instruments for F–111, C–141, and B–52 aircraft. Milwaukee. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Republic Aviation Corp.**, Farmingdale, N.Y. $1,521,832. Modification of F–105 aircraft. Crestview, Fla. Mobile Air Materiel Area (AFLC), Brookley AFB, Ala.

3—**Del E. Webb Corp.**, Phoenix, Ariz. $6,564,600. Construction of a 500-unit family housing project at George AFB, Victorville, Calif. Procurement Div., George AFB, Calif.

—**General Electric Co.**, West Lynn, Mass. $5,196,000. Aircraft engines, spare parts, and related ground equipment. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Radio Corp. of America, Electronic Data Processing Div.**, West Palm Beach, Fla. $1,846,451. Electronic data processing systems now on lease to the Air Force. Dir. of Procurement, Wright-Patterson AFB, Dayton, Ohio.

—**Republic Aviation Corp.**, Farmingdale, N.Y. $3,756,695. Modification kits and related items for F–105 aircraft. Farmingdale. Mobile Air Materiel Area (AFLC), Brookley AFB, Ala.

—**Hayes International Corp.**, Birmingham, Ala. $2,009,940. Production of modular bomb bay dispensers. Birmingham. Air Proving Ground Center, Dir. of Procurement, Eglin AFB, Fla.

—**Magnavox Co.**, Fort Wayne, Ind. $2,439,342. Radio sets for C–141 aircraft. Fort Wayne. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**Columbia University**, New York, N.Y. $1,855,621. Studies of sensors applicable to ICBM trajectory. New York. Air Force Office of Scientific Research, Washington, D.C.

4—**Hercules Powder Co.**, Wilmington, Del. $3,100,000. Stage III MINUTEMAN motors. Magna, Utah. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Massachusetts Institute of Technology**, Cambridge, Mass. $3,700,000. Research and development in the field of advanced electronics in support of Advanced Research Projects Agency. Lexington. Electronic Systems Div. (AFSC), L.G. Hanscom Field, Bedford, Mass.

—**Boeing Co.**, Seattle, Wash. $6,233,200. T–50 aircraft engines, spare parts, and support equipment. Seattle. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

5—**General Dynamics/Astronautics**, San Diego, Calif. $1,057,000. Spare parts in support of the ATLAS/AGENA boosters. San Diego. Space Systems Div. (AFSC), Los Angeles, Calif.

8—**North American Aviation, Inc., Autonetics Div.**, Anaheim, Calif. $1,500,000. Components of the improved MINUTEMAN guidance system. Anaheim. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**International Business Machines Corp.**, Rockville, Md. $2,788,000. Engineering research to develop improved computer programming techniques. Washington, D.C. and Omaha, Neb. Space Systems Div. (AFSC), Los Angeles, Calif.

—**General Dynamics/Astronautics**, San Diego, Calif. $1,280,000. ATLAS/AGENA space boosters. San Diego. Space Systems Div. (AFSC), Los Angeles, Calif.

9—**Sperry Rand Corp., Information & Communications Div.**, Carle Place, N.Y. $2,873,209. LORAN navigational systems. Carle Place. Systems Engineering Group (AFSC), Wright-Patterson AFB, Dayton, Ohio.

10—**Republic Aviation Corp.**, Farmingdale, N.Y. $15,358,300. F–105 modification kits. Farmingdale. Mobile Air Materiel Area(AFLC), Brookley AFB, Ala.

—**International Telephone & Telegraph Corp.**, Paramus, N.J. $1,108,486. Spare components for electronic data system (465L). Paramus. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

11—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $8,052,000. AGENA–D launch services for Eastern and Western Ranges during calendar year 1965. Space Systems Div. (AFSC), Los Angeles, Calif.

12—**International Business Machines Corp.**, Washington, D.C. $1,914,915. Electronic data processing systems. Poughkeepsie, N.Y. Dir. of Procurement, Wright-Patterson AFB, Dayton, Ohio.

—**R.P.R. Construction Co., Inc., and Harry M. Rubinstein**, Phoenix, Ariz. $4,118,900. Construction of 250 units of FY 65 family housing at Cannon AFB, Clovis, N.M. Procurement Div., Cannon AFB, N.M.

15—**General Electric Co.**, West Lynn Mass. $2,912,957. J–85 engines in support of the T–38 aircraft program. West Lynn. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

17—**General Dynamics/Electronics**, Rochester, N.Y. $5,135,727. Mobile communications equipment. Rochester. Electronics Systems Div. (AFSC), L.G. Hanscom Field, Bedford, Mass.

—**Curtiss-Wright Corp., Wright Aeronautical Div.**, Wood-Ridge, N.J. $1,386,045. J–65 engine components. Wood-Ridge. San Antonio Air Materiel Area (AFLC), Kelly AFB, Tex.

—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $6,300,600. Research and development work on a space program. Sunnyvale. Space Systems Div. (AFSC), Los Angeles, Calif.

18—**Massachusetts Institute of Technology**, Cambridge, Mass. $2,333,333. Basic research concerning matter in intense magnetic fields. Cambridge. Office of Aerospace Research, Washington, D.C.

19—**North American Aviation, Inc.**, Los Angeles, Calif. $8,150,000. XB–70 flight test program. Edwards AFB, Calif. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

—**AC Spark Plug Div., General Motors Corp.**, Flint, Mich. $4,594,318. Work on the TITAN II guidance system. Milwaukee, Wis. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Lockheed Missiles & Space Co.**, Sunnyvale, Calif. $1,500,000. Research and development for a satellite control network. Sunnyvale. Ballistics Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Boeing Co.**, Seattle, Wash. $25,185,000. Assembly, installation, and checkout of MINUTEMAN missiles for the Grand Forks AFB complex. Grand Forks, N.D. Ballistics Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

23—**Morrison-Knudsen & Associates**, South Gate, Calif. $46,585,000. Construction of MINUTEMAN missile launch facilities at Malmstrom AFB. Great Falls, Mont. Army Corps of Engineers Ballistic Missiles Construction Office (AFSC), Norton AFB, San Bernardino. Calif.

—**Burroughs Corp., Defense & Space Group**, Paoli, Pa. $1,375,000. Radar maintenance and supply support. Paoli. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

24—**Communication Systems, Inc.**, Paramus, N.J. $2,434,000. A design study program for the defense communications system. Paramus. Electronic Systems Div. (AFSC), L. G. Hanscom Field, Bedford, Mass.

—**Curtiss-Wright Corp.**, Caldwell, N.J. $2,260,000. Work on the X–19 aircraft program. Caldwell. Aeronautical Systems Div. (AFSC), Wright-Patterson AFB, Dayton, Ohio.

25—**American Electric, Inc.**, Paramount, Calif. $2,074,820. Production of ordnance. Paramount and Long Beach, Calif. Ogden Air Materiel Area (AFLC), Hill AFB, Utah.

—**Bendix Field Engineering Corp.**, Owings Mills, Md. $1,282,390. Conversion and modernization of radar equipment. Owings Mills. Rome Air Materiel Area (AFLC), Griffiss AFB, N.Y.

—**General Motors Corp., Allison Div.**, Indianapolis, Ind. $1,098,802. Spare parts for T–56 engines. Indianapolis. Oklahoma City Air Materiel Area (AFLC), Tinker AFB, Okla.

26—**Atlantic Research Corp.**, Duarte, Calif. $2,071,000. Development of special test vehicles for re-entry vehicle systems. Duarte. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Bunker-Ramo Corp.**, Canoga Park, Calif. $1,235,000. A visual analysis display system. Canoga Park. Rome Air Development Center (AFSC), Griffiss AFB. N.Y.

—**General Dynamics Corp., Convair Div.**, San Diego, Calif. $1,500,000. Modification of ATLAS missiles. San Diego. Ballistic Systems Div. (AFSC), Norton AFB, San Bernardino, Calif.

—**Thiokol Chemical Corp.**, Brigham City, Utah. $3,449,400. GENIE rocket motors. Promontory, Utah. Ogden Air Materiel Area (AFLC). Hill AFB, Utah.

—**Liles Construction Co., Inc.**, Montgomery, Ala. $1,275,326. Construction of family housing at Eglin AFB. Valparaiso, Fla. Air Proving Ground Center (AFSC), Eglin AFB, Fla.

# Advance Procurement Planning Marks First Year's End With Continued Money Savings

A program of Advance Procurement Planning designed to increase competitive bidding among Defense Supply Agency (DSA) industry suppliers is bringing continued monetary savings.

Initiated by the Executive Directorate, Procurement & Production, Headquarters DSA, more than a year ago, the program is now operating virtually on a DSA-wide basis and has been widely praised by industry as a significant innovation in the procurement field.

"Advance Procurement Planning is a program for providing industry suppliers with early information concerning future buying plans for major items on which large dollar procurements are anticipated," according to Harold J. Margulis, Chief, Procurement Division, Headquarters DSA, who is directing the program.

This advance information on anticipated DSA procurement informs industry of the amount and the timing of Government purchases and, in turn, enables industry to plan more effectively for the submission of bids and for the utilization of available production capability.

Advance Procurement Planning information is usually given to industry on a yearly basis, with the information brought up to date periodically. This increased lead time in purchasing helps not only to alert greater numbers of facilities in a particular industry as to what the Government plans to purchase, but also enables DSA procurement specialists to buy in more advantageous markets.

The planning is directed toward items which will remain in the supply system for some time. No advance procurement advice to industry is attempted on short-run and phase-out items or among new items which offer insufficient demand experience.

An example of procurement planning is the advance information given the clothing industry on the Government's intended purchase of men's cotton sateen trousers for the Army. Long before the contracts were offered for bidding, information was circulated to industry that in the third quarter of FY 1965 DSA planned to buy approximately 1.9 million pairs, and in the first quarter of the next year, 2.6 million pairs.

Other advance procurement information has been made available to industry on such varied items as photographic film, metal conduits, electron tubes, nylon flying helmets and men's coated nylon-twill raincoats.

Another technique used by DSA procurement personnel for saving funds is Market Analysis. The Supply Centers concentrate on selected items which can be purchased at better prices through taking advantage of seasonal and other factors influencing purchase prices. Entering the market to schedule Government production in the valleys between peaks in civilian production results in more favorable pricing for Government purchases. Maintaining the continuity of production lines avoids repetitive start-up costs. Taking advantage of quantity-price breaks is another technique for procurement cost savings. DSA is identifying regularly new opportunities for use of market analysis to more efficiently procure the Government's needs at lower costs.

### CLARIFICATION

Due to several inquiries indicating misunderstanding of an article published on page 14 of the February issue of the *Bulletin*, the following clarification of second paragraph should be noted:

"Spurred on by Deputy Secretary Cyrus Vance, a new data language vocabulary is to be phased into use throughout the defense establishment. Transition will be gradual so as to cause minimum problems, but eventually all DOD data systems will use the same data language vocabulary composed of standard data elements and data codes. As a result of this effort, these systems will be able to interchange information and data far faster, more accurately and at less cost than at present."

This change points out that DOD Directive 5000.11 is speaking of a data vocabulary and language and not a computer programming langauge.

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WASHINGTON, D. C. 20301

OFFICIAL BUSINESS

FLARE

## AMC Tests Industry Information Liaison Office

The U. S. Army Materiel Command (AMC) has begun testing a new Army Industry Materiel Information Liaison Office (AIMILO) Program designed to provide future market information in an effort to deepen and broaden industry competition for the Army's procurement dollar and bring down acquisition costs.

The program is built around an Advanced Planning Procurement Information (APPI) form which will be prepared on each end item to be procured by the expenditure of PEMA (Procurement Equipment & Missiles, Army) funds in the annual budget.

APPI data will include pertinent historical facts about the end item, current fiscal year procurement action, and the Army's planned procurements through the following six years. Included also will be statistics pertaining to quantities, monthly production rates and anticipated methods of procurement.

The APPI will be released to current bidders and sources cleared to receive it by the procuring agency's AIMILO; concurrently, the APPI will be synopsized for public media in order to advertise its availability to all industries. Those interested may obtain identical APPI at any one of the nine AIMILO's established for this purpose by presenting proof of security clearance required; or, lacking proof, by initiating actions that will enable them to receive APPI in the future.

For test purposes, AIMILO's have been established at the following AMC organizational elements: Electronics Command, Ft. Monmouth, N. J.; Missile Command, Huntsville, Ala.; Weapons Command, Rock Island, Ill.; Munitions Command, Dover, N. J.; Tank Automotive Center, Warren, Mich.; Mobility Equipment Center, St. Louis, Mo.; Aviation Materiel Command, St. Louis, Mo.; Los Angeles Procurement District, Pasadena, Calif.; San Francisco Procurement District, Oakland, Calif.

The Pilot Test of the AIMILO Program is being conducted by Brigadier General R. C. Conroy, AMC's Deputy Commanding General for Western Operations, Ft. Mason, San Francisco, Calif.

## AFSC Documents Should Be Obtained From Procuring Agency

Difficulty is being experienced at Air Force System Command (AFSC) headquarters in meeting the requirements of contractors or prospective contractors for AFSC documents needed in responding to Requests for Proposals, etc. This is true particularly in the case of requests for AFSC/AFLC Manual 310–1, "Management of Contractor Data and Reports."

Some of the difficulty may stem from a lack of understanding of the official Air Force distribution procedures. According to prescribed procedures, the procuring activity or office administering the contract—the Air Force Contract Management District, the Air Force Plant Representative, System Project Office, or similar procuring agency—is responsible for providing copies of Air Force documents to contractors when required. Requests made directly through these channels should result in expeditious responses to contractor requests for necessary publications.